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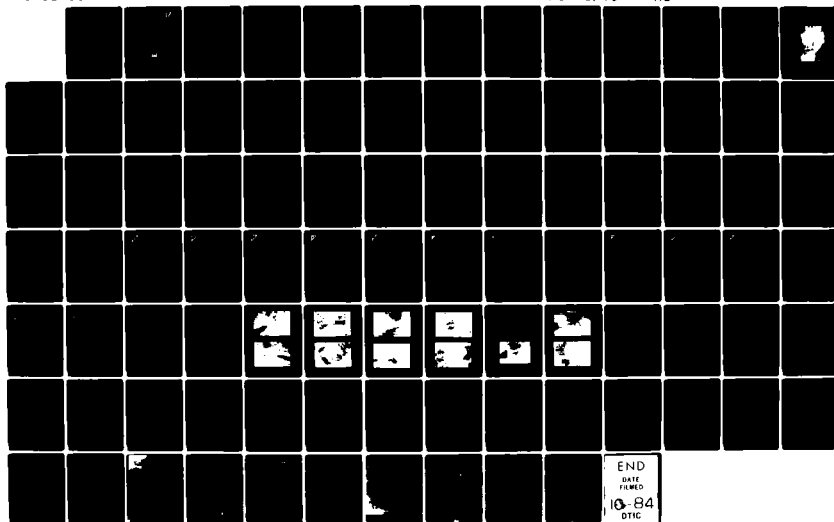
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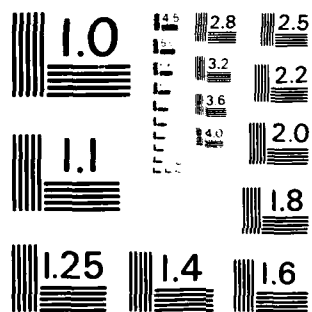
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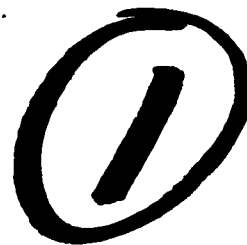




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AD-A145 308

CONNECTICUT RIVER BASIN  
SPRINGFIELD, MASSACHUSETTS



SILVER LAKE DAM  
MA 00066

PHASE 1 INSPECTION REPORT  
NATIONAL DAM INSPECTION PROGRAM

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DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENGINEERS  
WALTHAM, MASS. 02154

OCTOBER 1978

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
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4. TITLE (and Subtitle) Silver Lake Dam  NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS		5. TYPE OF REPORT & PERIOD COVERED INSPECTION REPORT
7. AUTHOR(s) U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS		8. CONTRACT OR GRANT NUMBER(s)
11. CONTROLLING OFFICE NAME AND ADDRESS DEPT. OF THE ARMY, CORPS OF ENGINEERS NEW ENGLAND DIVISION, NEDED 424 TRAPELO ROAD, WALTHAM, MA. 02254		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Silver Lake Dam is an earthfill embankment about 85 feet long, 12 feet high with a crest width averaging about 30 feet. The project appears to be in fair condition. Since the dam is classified as small in size, with a significant hazard potential, the test flood is one half the PMF.		



DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENGINEERS  
424 TRAPELO ROAD  
WALTHAM, MASSACHUSETTS 02154

REPLY TO  
ATTENTION OF:

NEDED

DEC 27 1975

Honorable Michael S. Dukakis  
Governor of the Commonwealth of  
Massachusetts  
State House  
Boston, Massachusetts 02133

Dear Governor Dukakis:

I am forwarding to you a copy of the Silver Lake Dam Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

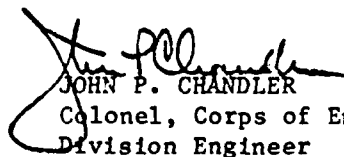
A copy of this report has been forwarded to the Department of Environmental Quality Engineering, the cooperating agency for the Commonwealth of Massachusetts. In addition, a copy of the report has also been furnished the owner, The Silver Lake Association, Dr. William J. Osborn, President, 42 Edgewater Road, Agawam, Massachusetts 01001.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Quality Engineering for your cooperation in carrying out this program.

Sincerely yours,

Incl  
As stated

  
JOHN P. CHANDLER  
Colonel, Corps of Engineers  
Division Engineer

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**SILVER LAKE DAM  
MA 00066**



**CONNECTICUT RIVER BASIN  
SPRINGFIELD, MASSACHUSETTS**

**PHASE 1 INSPECTION REPORT  
NATIONAL DAM INSPECTION PROGRAM**

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## NATIONAL DAM INSPECTION PROGRAM

### PHASE I INSPECTION REPORT

Identification No: MA 00066  
Name of Dam: SILVER LAKE DAM  
Town: AGAWAM  
County: HAMPDEN  
State: COMMONWEALTH OF MASSACHUSETTS  
Stream: UNNAMED TRIBUTARY OF THREE MILE BROOK  
Date of Inspection: 28 SEPTEMBER 1978

#### BRIEF ASSESSMENT

Silver Lake Dam is an earthfill embankment about 85 feet long, 12 feet high with a crest width averaging about 30 feet. A 9.5 feet wide concrete overflow spillway with a low level notch and 37 inch freeboard is located on the south end of the dam. The spillway is flanked by concrete and stone masonry training walls. A 2 feet wide, 3 feet high low level sluiceway is located at the base of the spillway and discharges are manually controlled by a gate valve. Discharges from the spillway and low level outlet are into a natural brook which flows into Three Mile Brook, a tributary of the Connecticut River.

Phase I inspection and evaluation of Silver Lake Dam does not indicate conditions which would constitute an immediate hazard to human life or property. Based on engineering judgment and the performance of the earth embankment and outlet works, the project appears to be in fair condition. The project, however, does have inadequacies and deficiencies which, if not remedied, have the potential for developing into hazardous conditions.

Because there are no data on Probable Maximum Floods for an area of 1.13 square miles, it was necessary to synthesize a test flood hydrograph for the contributing area. Since the dam is classified as small in size, with a significant hazard potential, the test flood, in accordance with Corps of Engineers guidelines, is one half the Probable Maximum Flood (1/2 PMF). The

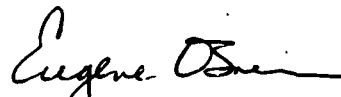
1/2 PMF inflow-peak was 2353 cfs, with a runoff volume equivalent to 18.65 inches in 6 hours. The adequacy of the spillway was tested by routing the flood through the reservoir using a computerized routing technique. The peak outflow from the 1/2 PMF was 1906 cfs at El 131.3 or about 3.2 feet above the top of the dam.

Since the dam is expected to be overtopped with an inflow equal to 1/2 PMF, it is considered that the spillway is not adequate from a hydraulic and hydrologic standpoint.

It is recommended that a competent consulting engineer be retained by the owner, within 12 months of receipt of this Phase I Inspection Report, to determine the measures necessary for improvement of the discharge capacities.

In addition, remedial measures are recommended for implementation by the owner, within 24 months of receipt of this Phase I Inspection Report, to improve overall conditions. These measures, in general, are as follows:

- Repairs to embankment and appurtenant structures
- Programs for operation, maintenance and inspection



Eugene O'Brien, P.E.  
New York No. 29823

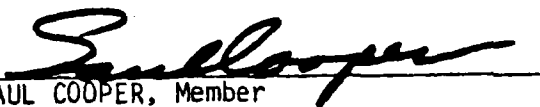
This Phase I Inspection Report on Silver Lake Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.



CHARLES G. TIERSCH, Chairman  
Chief, Foundation and Materials Branch  
Engineering Division

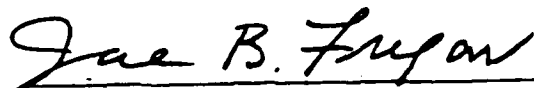


FRED J. RAVENS, Jr., Member  
Chief, Design Branch  
Engineering Division



SAUL COOPER, Member  
Chief, Water Control Branch  
Engineering Division

APPROVAL RECOMMENDED:



JOE B. FRYAR  
Chief, Engineering Division

## PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

CONNECTICUT RIVER BASIN  
SILVER LAKE DAM  
INVENTORY NO. MA 00066  
PHASE I INSPECTION REPORT

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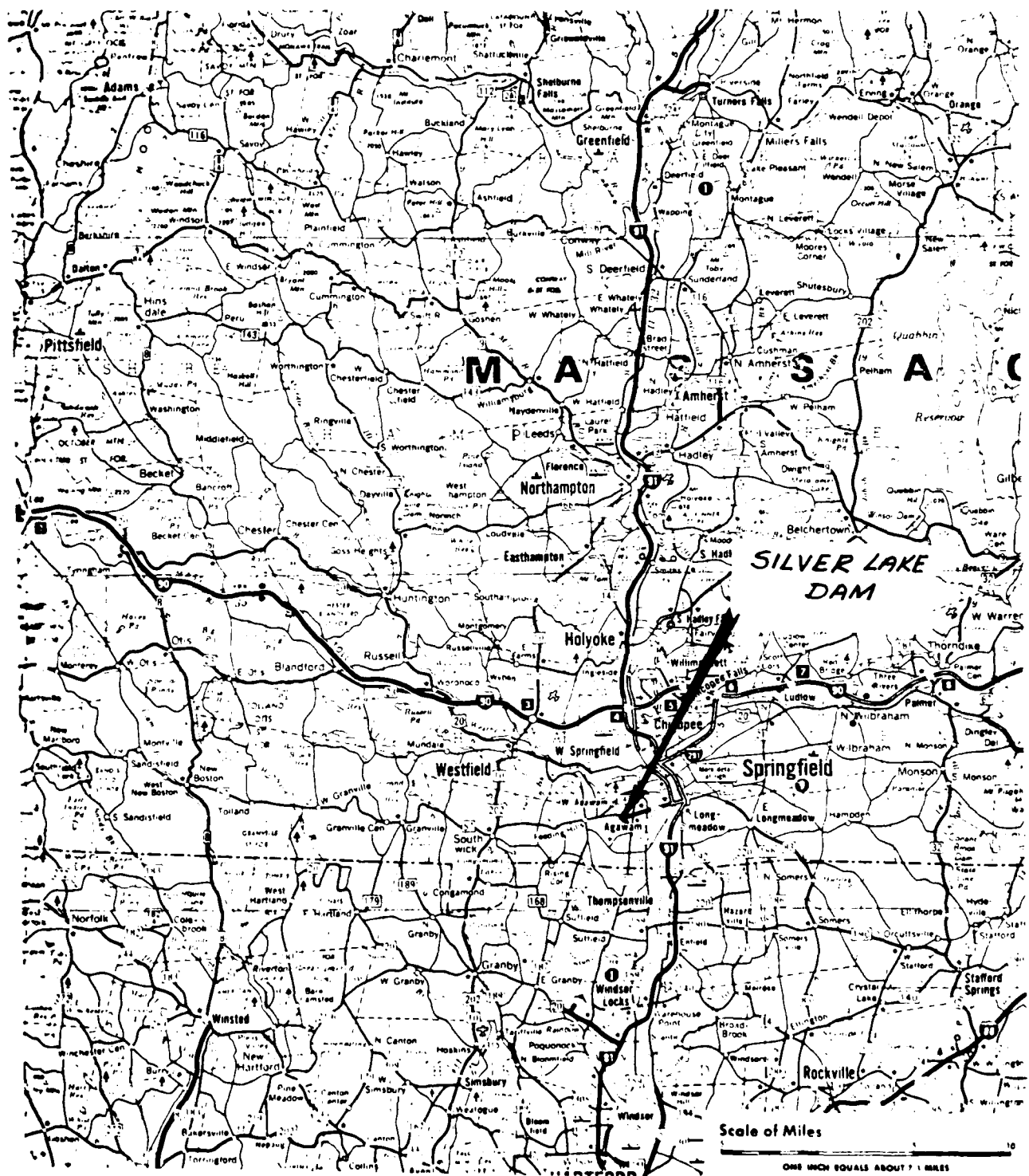
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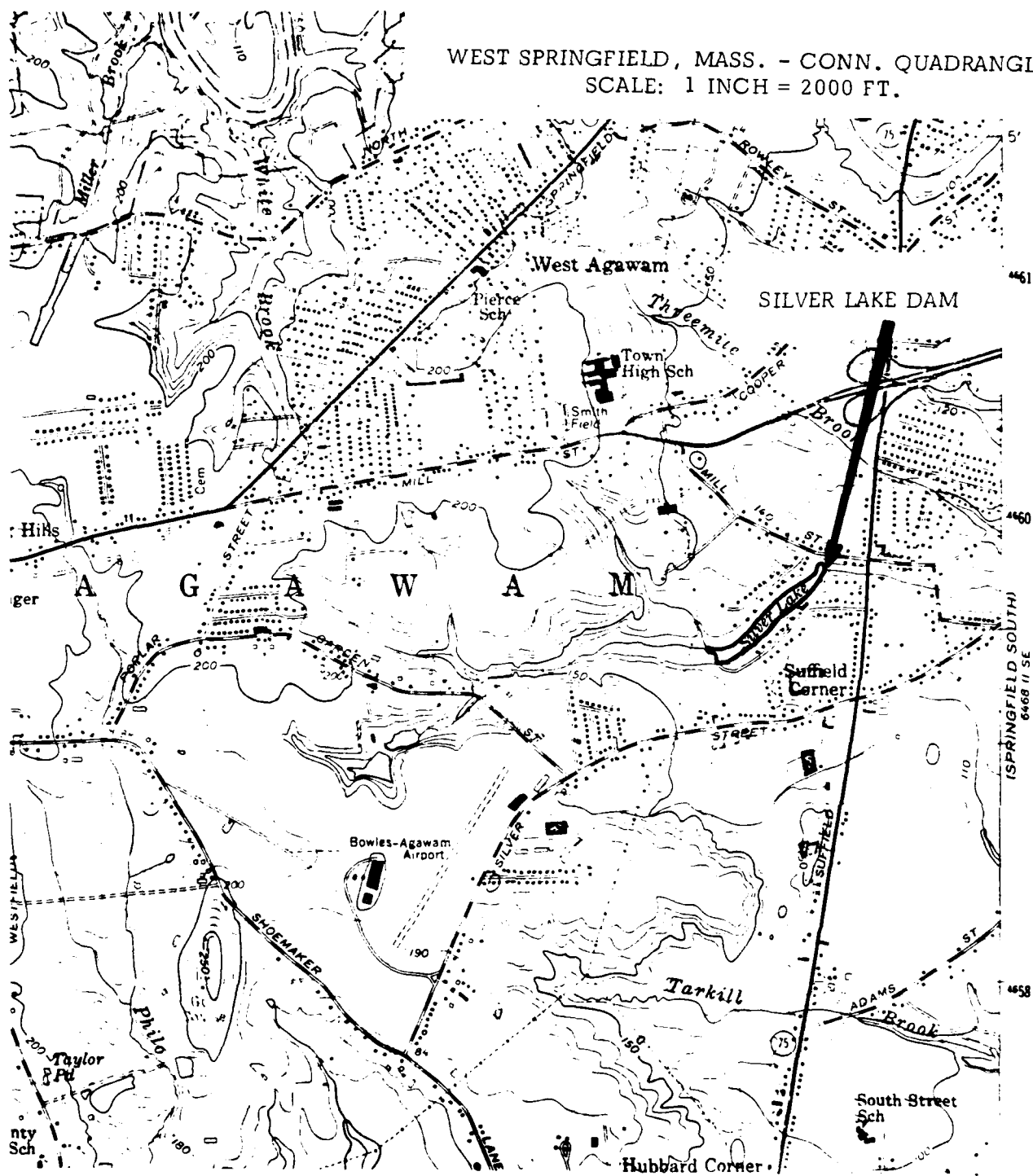


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VICINITY MAP  
SILVER LAKE DAM

WEST SPRINGFIELD, MASS. - CONN. QUADRANGLE  
SCALE: 1 INCH = 2000 FT.



TOPOGRAPHIC MAP  
SILVER LAKE DAM

PHASE I INSPECTION REPORT  
NATIONAL DAM INSPECTION PROGRAM  
CONNECTICUT RIVER BASIN  
INVENTORY NO. MA 00066  
SILVER LAKE DAM  
TOWN OF AGAWAM  
HAMPDEN COUNTY, COMMONWEALTH OF MASSACHUSETTS

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of the dams within the New England Region. Tippetts-Abbott-McCarthy-Stratton has been retained by the New England Division to inspect and report on selected dams in the State of Massachusetts. Authorization and notice to proceed was issued to Tippetts-Abbott-McCarthy-Stratton under a letter of May 3, 1978, from Mr. Ralph T. Garver, Colonel, Corps of Engineers. Contract No. DACW 33-78-C-0298 has been assigned by the Corps of Engineers for this work.

b. Purpose

- (1) Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.
- (2) Encourage and prepare the States to initiate quickly effective dam safety programs for non-Federal dams.
- (3) To update, verify and complete the National Inventory of Dams.

1.2 DESCRIPTION OF THE PROJECT

a. Description of the Dam and Appurtenances

Silver Lake Dam is an earthfill embankment of a maximum height of about 12 feet. The crest of the dam is about 85 feet long and the width varies from 10 to 40 feet, averaging about 30 feet. The upstream slope of the embankment varies between 1V on 3H to 1V on 4H, except in the vicinity of the spillway

where the slope is nearly vertical. The downstream slope of the embankment is non-uniform and averages about 1V on 2H, except in the vicinity of the spillway, where the slope is nearly vertical.

A concrete overflow spillway, which is 9.5 feet wide, with a center 48 inch by 8 inch weir notch is located at the south end of the dam. The spillway on the upstream side is flanked by concrete and stone masonry training walls of a height of 37 inches. These walls once served as the upstream approach walls for an old spillway, which is now partially destroyed. The downstream training walls are of concrete block masonry. Water flow over the spillway is channeled into an old masonry spillway chute about 13 feet long, then a stepped concrete chute about 20 feet long, finally into an unnamed natural brook, which discharges into Three Mile Brook, a tributary of the Connecticut River.

A low level outlet consisting of a sluiceway, 2 feet wide by 3 feet high, is located at the bottom center of the spillway. Discharges are manually controlled by a center screw-type gate valve located on the upstream side of the spillway.

b. Location

The dam is located in the town of Agawam, about one mile west of the Connecticut River at the intersection of Suffield Street (Massachusetts Route 75) and Mill Street.

c. Ownership

Silver Lake Dam is owned by Mr. Kenneth Hinshaw, Box 32, Gollendale, Washington, 98620. The day to day operation and maintenance is managed by the Silver Lake Association.

d. Purpose of Dam

The impoundment provided by the dam is for recreational purposes.

e. Design and Construction History

Original design and construction records are not available. It is reported that the dam was built in about 1878 and that the original spillway was destroyed in the floods of 1955. The present spillway was reported constructed in about 1956. There are no construction records for these repairs.

f. Normal Operating Procedures

The normal operating procedure is to drain the lake once a year by opening the low level outlet. The purpose is to clean the lake bottom.

g. Size Classification

The dam is less than forty feet high, and has a maximum storage of less than 1000 acre-feet. It is, therefore, classified as a "small" dam.

h. Hazard Classification

The dam is in the "significant" hazard potential category because there are, immediately downstream from the dam, about 5 homes and Suffield Street (Mass. Route 75) which could sustain some damage should a failure of the dam occur.

For details on the selection of the hazard potential category see Section 5.1d.

i. Operator

There are no day-to-day operations of the dam and no one has been designated as the operator of the dam. In case of emergency, the President of Silver Lake Association is to be notified. The present President of the Association is:

Dr. William J. Osbourn  
42 Edgewater Road  
Agawam, Massachusetts 01001  
Telephone (413) 786-1800 (Office)  
(413) 786-7124 (Home)

1.3 PERTINENT DATA

a. Drainage Area

The total drainage area contributing to Silver Lake Dam is about 723 acres, roughly fan shaped with an east-west axis, about 25% urban development and the remainder wooded and/or farms and orchards.

b. Discharges at Damsite

Discharges at the damsite are over an uncontrolled concrete spillway and through a low level sluiceway.

The concrete overflow spillway is 9.5 feet wide with a center weir notch 4 feet wide by 8 inch high. The computed maximum discharge capacity, with the reservoir level at top of dam, El 128.1, is 127 cfs.

The low level sluiceway, 2 feet wide, 3 feet high, is located at the bottom center of the spillway. The computed maximum discharge, with head equivalent to top of dam, El 128.1, is 89 cfs.

There is no record of the maximum flood at the dam site, however, it is reported that during the 1955 flood the water level rose about 9 feet along the lake shore.

c. Elevation (feet above MSL)

Top of dam	128.1
Maximum pool-design surcharge	Unknown
Maximum pool-test flood	131.3
Full flood control pool	Not Applicable
Recreation pool	125.0
Spillway crest (gated)	Not Applicable
Upstream portal invert diversion tunnel	Not Applicable
Downstream portal invert diversion tunnel	Not Applicable
Streambed at centerline of dam	Unknown
Maximum tailwater	Unknown

d. Reservoir (feet)

Length of maximum pool	3850
Length of recreation pool	2000
Length of flood control pool	Not Applicable

e. Storage (acre-feet)

Recreation pool	54
Flood control pool	Not Applicable
Design surcharge	Unknown
Test flood surcharge (net)	141.7
Top of dam	106

f. Reservoir Surface (acres)

Top of dam	22.1
Test flood pool	34.3
Flood-control pool	Not Applicable
Recreation pool	11.1
Spillway crest	11.1

g. Dam

Type	Earth
Length, feet	85±
Height, feet	12±
Top width	Varies from 10 feet to 40 feet with an average of about 30 feet.
Side Slopes - Upstream	Varies from 1V on 3H to 1V on 4H except in the vicinity of spillway where its nearly vertical
- Downstream	1V on 2H average, except in vicinity of spillway where its nearly vertical
Zoning	Unknown
Impervious core	Unknown
Cutoff	Unknown
Grout curtain	Unknown

h. Diversion and Regulating Tunnel

Type	Not Applicable
Length	Not Applicable
Closure	Not Applicable
Access	Not Applicable
Regulating facilities	Not Applicable

i. Spillway

Type	Broad-crested
Length of weir, feet	9.5 feet
Crest elevation, feet	125.0
Gates	None
Upstream channel	None
Downstream channel	See description in Section 1.2 and Section 3.1

j. Regulating Outlets

The regulating outlets consist of an uncontrolled spillway and a low level sluiceway.

The 9.5 feet wide concrete overflow spillway consists of a center weir notch, 4 feet wide by 8 inch high.

The low level sluiceway, 2 feet wide by 3 feet high, is located at the bottom center of the spillway. The invert is estimated at El 119.0. Discharges into the downstream channel are controlled by a manually operated center screw-type gate valve located on the upstream side of the spillway. It is reported that the valve is operable.

## SECTION 2 - ENGINEERING DATA

### 2.1 DESIGN

There are no design data, construction drawings or specific memoranda available for the dam. One drawing, a survey map, was obtained from the Town which gives elevations at various points upstream and downstream of the dam. (See Appendix). The elevations shown on this drawing are referenced to a datum different than that shown on the USGS Quadrangle Sheet. Therefore a correlation between the USGS Quadrangle Sheet and the available survey map was made by interpolating an elevation for the crest of the spillway weir notch, from the Quadrangle Sheet. It was assumed that this elevation was also the normal lake level and all other elevations shown in this report were referenced to it. The sketch, plan and section of the spillway, which are attachments to a 1974 inspection report, were prepared by the Department of the Environmental Quality Engineering, Division of Waterways and were obtained from the Massachusetts Department of Public Works, Boston.

There is no information available on subsurface conditions.

### 2.2 CONSTRUCTION RECORDS

There are no records available for the original construction or subsequent repairs.

### 2.3 OPERATION RECORDS

No operating records are available and there is no daily record of pool elevation or rainfall at the damsite. The yearly reservoir drawdown is recorded in the minutes of meetings of Silver Lake Association which are available.

### 2.4 EVALUATION OF DATA

#### a. Availability

Existing information was made available by Silver Lake Association, Agawam, Massachusetts; the Town of Agawam; and Massachusetts Department of Public Works, Boston, Massachusetts.

#### b. Adequacy

The lack of in-depth engineering data did not allow for a definitive review. Therefore, the adequacy of this dam could not be assessed from the

standpoint of reviewing design and construction data , but is based primarily on visual inspection, past performance history and sound engineering judgment.

c. Validity

In general, the information obtained from above mentioned drawing and sketches, with above noted exceptions, and the personal interviews is consistent with observations made during the inspection and therefore considered reliable.

## SECTION 3 - VISUAL INSPECTION

### 3.1 FINDINGS

#### a. General

A visual inspection of Silver Lake Dam was made on 28 September 1978. The weather was cloudy, temperature 60°F to 65°F. The last rainfall occurred about one week before. At the time of inspection, the pond level was about 2 inches above spillway weir notch. (El 125.17)

#### b. Embankment

The earth embankment is in fair condition. The horizontal and vertical alignments of the crest are good. The crest is covered with heavy vegetation, shrubs, ground cover, saplings and large trees (See Photograph No. 2). No longitudinal or transverse surface cracks were observed.

The downstream slope is irregular and completely covered with heavy vegetation, shrubs, ground cover, saplings and large trees. (See Photograph No. 3). There are no signs of sloughing, erosion or cracks.

The upstream slope is covered with grass, shrubs, trees but in some areas the turf is non-existent. (See Photograph No. 1). The upstream spillway approach channel slopes are undercut and eroded. The southern approach channel slope is extensively undercut and eroded and there is some erosion behind the training wall at the contact with the slope. (See Photograph Nos. 11 and 12). There are no signs of sloughing, or cracks. In the vicinity of the embankment and north training wall contact there is a deep gully which is caused by pedestrian traffic and runoff. Otherwise the remainder of slope does not exhibit any signs of trespassing.

#### c. Appurtenant Structures

The concrete overflow spillway above the water level is in good condition with some minor spalling. The upstream stone masonry training walls above the water level are in poor condition with stone missing and joints open. The north training wall has a 2.5 inch wide crack and cavities as a result of the missing stones. The downstream spillway training wall consists of concrete with large gravel and stone aggregate and concrete blocks. The north wall is in poor condition with stone missing in several areas. Other deficiencies noted on this wall are:

a) the upper 2 to 3 feet is tilting towards the chute, resulting in about 6 inches of surface settlement of the adjacent embankment.

b) minor seepage, 3 feet from top of wall, at the contact between the wall and the spillway weir. (See Photograph No. 10).

The south downstream training wall is in extremely poor condition with the upper two-thirds of the wall completely missing and results in deep erosion of the earth bank. (See Photograph No. 9).

The floor of the downstream chute (formerly the spillway approach apron) is in fair condition with some debris observable. Remnants of the old destroyed spillway remain and extend about 2 feet from each side into the spillway channel. (See Photograph Nos. 6 and 8).

At the time of inspection, the valve stem for the low level gate valve was below the water level. It is reported that the operating handle and stem extension are removed to prevent vandalism. It is reported that the valve is operable.

d. Abutments

There are no signs of seepage at the abutments. The north abutment of the dam does not show any unusual conditions, however, the south abutment slope, adjacent to the spillway, does show signs of erosion, which appears to be the result of spillway discharges and surface runoff.

e. Downstream Channel

The stepped concrete chute appears to be in good condition. (See Photograph No. 5). The remainder of the channel, which is natural, appears to be clear with very little debris, but with some overhanging trees. (See Photograph No. 7).

f. Reservoir Area

In the vicinity of the dam there is no evidence of sloughing, potentially unstable slopes or other unusual condition which would adversely affect the dam.

3.2 EVALUATION OF OBSERVATIONS

Visual observations made during the course of the investigation revealed several deficiencies which at present do not adversely affect the adequacy of

the dam. However, these deficiencies do require attention and should be corrected before further deterioration leads to hazardous conditions. Recommended measures to improve these conditions are given in Section 7.

## SECTION 4 - OPERATION AND MAINTENANCE PROCEDURE

### 4.1 PROCEDURES

There are no formal operational procedures for the project, other than the yearly drawing down of the lake.

### 4.2 MAINTENANCE OF DAM

There is no formal maintenance manual for the project. No maintenance of the embankment and appurtenant structures has been provided. There is no scheduled program of inspection by the owner or the Silver Lake Association, however, there is a statewide program of inspection established several years ago by the Department of Environment Quality Engineering Division of Waterways. Copies of their inspection reports, dated October 20, 1972 and May 1, 1974, are included in the Appendix.

### 4.3 MAINTENANCE OF OPERATING FACILITIES

There is no established maintenance program for the operating facilities.

### 4.4 WARNING SYSTEM IN EFFECT

There is no warning system in effect.

### 4.5 EVALUATION

The maintenance and operating procedures for the dam and appurtenant structures are considered inadequate. Measures to improve these deficiencies are given in Section 7.

## SECTION 5 - HYDRAULIC/HYDROLOGIC

### 5.1 EVALUATION OF FEATURES

#### a. Design Data

No design data are available, nor are records of flow from this small drainage area. It was therefore necessary to synthesize a test flood for the contributing area of 1.13 square miles. The reservoir area is 11.1 acres or 1.5% of the total drainage basin. The basin is roughly fan-shaped with an east-west axis, with approximately 25% urban development and the rest being wooded and/or farms and orchards.

#### b. Experience Data

It is reported by persons interviewed that during the 1955 flood the spillway was destroyed and the lake level rose about 9 feet. If the lake did rise this amount, it is probable that the dam was overtopped, however, no one could substantiate this fact.

#### c. Visual Inspection

At the time of the inspection, the lake level was 2 inches above the spillway weir notch. The spillway is in good condition with only minor spalling of the concrete. The training walls upstream and downstream are in poor condition with stones missing and joints open. The floor of the downstream chute is in fair condition. Remnants of the destroyed spillway remain and extend about 2 feet from each side into the spillway channel. The valve stem for the low level gate valve is below the water line with the handle and stem extension removed for safety purposes.

For further details see Section 3.1.c.

#### d. Overtopping Potential

The potential for overtopping the dam was investigated on the basis of the adequacy of the spillway and the available surcharge storage to meet a potential emergency inflow. The dam, with a maximum storage capacity of 106 acre-feet and 12 feet high, is classified as "small".<sup>1/</sup>

To determine the hazard potential category, it is necessary to estimate the downstream dam failure hydrograph, and the U.S. Corps of Engineers "Rule of Thumb" guidance was used for this purpose. The estimate assumes

the following: (a) the reservoir surface is at the top of the dam at the time of the breach, (b) a breach of 38.0 feet equal to 40% of the dam length occurs (c) the channel has an average roughness coefficient of 0.07. It is estimated that the peak discharge would be 2655 cfs and at a selected section, just upstream of Suffield Street (Mass. Route 75), the flood wave would be about 4.5 feet deep, with the wave peak at about El 115.5. Mass. Route 75 and about 5 homes, located in this vicinity, could conceivably be damaged by the estimated flood wave and for these reasons the dam is in a "significant" hazard potential category.

Because the dam is classified as small in size, with a significant hazard potential, the test flood, is one-half the Probable Maximum Flood (1/2 PMF).<sup>1/</sup> The Maximum Probable 6-hour rainfall over 10 square miles for the Silver Lake area is 18.65 inches.<sup>2/</sup>

Based on the Soil Conservation Services' curve number method,<sup>3/</sup> the rainfall excess was determined as 15.8 inches. A triangular unit hydrograph<sup>4/</sup> was developed to represent unit runoff from the land area, and subsequently used to compute the flood hydrograph. The runoff resulting from 18.65 inches of rain over the lake area (11.1 acres) was added to the computed hydrograph to form the Test Flood (1/2 PMF), and resulted in a peak inflow discharge of 2353 cfs.

Silver Lake Dam is equipped with a 2 feet by 3 feet valve controlled sluiceway, about 6.0 feet below the spillway crest (El 125). The computed capacity of the sluiceway with water level at El 125.0 and El 128.1 is 67 and 89 cfs, respectively. The spillway is 9.5 feet wide, with a 4 feet by 8 inch low flow weir notch (see sketch in Appendix). The computed spillway discharge capacity, with the water level at the top of the training walls (El 128.1) is 127 cfs. It was assumed that (1) the spillway would act as a broadcrested weir, (2) flow over the dam would be critical, and (3) the lake was full (spillway crest El 125) at the start of the flood inflow. The old spillway, 13 feet downstream, is not expected to cause any back water effect since a discharge of 127 cfs would cause an estimated head of less than 4 feet. The computed surcharge storage between the spillway crest (El 125) and the top of the dam (El 128.1) is 52 acre-feet.

The Test Flood, routed through the available surcharge storage and discharge facilities using a computerized technique, results in a rise of the lake level to a maximum elevation of 131.3 or 3.2 feet above the top of the dam, with a peak outflow discharge of 1906 cfs. The spillway capacity is 6.7% of the Test Flood outflow, and is, from a hydraulic and hydrologic viewpoint inadequate.

References:

- 1/ Recommended Guidelines for Safety Inspection of Dams, Appendix D,  
U. S. Corps of Engineers.
- 2/ Hydrometeorological Report No. 33, 1956.
- 3/ Engineering Handbook Supplement A Section 4 Soil Conservation Service.
- 4/ Design of Small Dams. Bureau of Reclamation 1974.

## SECTION 6 - STRUCTURAL STABILITY

### 6.1 EVALUATION OF STRUCTURAL STABILITY

#### a. Visual Observations

Visual observation did not indicate any serious structural problems with the embankment, spillway or low level outlet. The deficiencies, which are described in Section 3, require attention; recommended measures to improve the deficient conditions are given in Section 7.

#### b. Design and Construction Data

No design computations or other data regarding the structural stability of the dam have been located.

On basis of the performance experience, the visual inspection, as well as engineering judgment, the dam appears to be adequate.

#### c. Operating Records

There are no operating records kept or available, except records of reservoir drawdown. There are no records or reports of any operational problems which would affect the stability of the dam.

#### d. Post-Construction Changes

It is reported that the present dam was built about 1878. There are no records of any construction changes which have taken place since that time. It is reported that a new spillway was built in about 1956, after the 1955 floods had destroyed the original spillway.

#### e. Seismic Stability

The dam is located in Seismic Zone No. 2 and in accordance with recommended Phase I guidelines does not warrant seismic analysis.

## SECTION 7 - ASSESSMENT, RECOMMENDATIONS & REMEDIAL MEASURES

### 7.1 DAM ASSESSMENT

#### a. Conditions

Phase I investigation of Silver Lake Dam does not indicate conditions which would constitute an immediate hazard to human life or property. Based on engineering judgment and the performance of the earth embankment and outlet works, the project appears to be in fair condition. The project, however, does have inadequacies and deficiencies which, if not remedied, have the potential for developing into hazardous conditions.

Because there are no data on Probable Maximum Floods for an area of 1.13 square miles, it was necessary to synthesize a test flood hydrograph for the contributing area equal to one-half Probable Maximum Flood (1/2 PMF). The 1/2 PMF inflow-peak was 2353 cfs, with a runoff volume equivalent to 18.65 inches in 6 hours.

The adequacy of the spillway was tested by routing the flood through the reservoir using a computerized routing technique. The water surface was assumed to be at the spillway crest at the start of the storm. The peak outflow from the routed flood (1/2 PMF) was 1906 cfs at El 131.3 or about 3.2 feet above the top of the dam.

The discharge capacity of the spillway with reservoir El 128.1 is 89 cfs or 6.7% of the 1/2 PMF outflow, and is considered to be very inadequate.

#### b. Adequacy of Information

The lack of in-depth engineering data did not allow for a definitive review. Therefore the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, past performance history and sound engineering judgment.

#### c. Urgency

The recommendations and remedial measures described in subsequent paragraphs should be undertaken by the owner within the next 12 to 24 months, after receipt of this Phase I Inspection Report.

d. Necessity for Additional Investigations

Additional investigations to assess the adequacy of the dam and appurtenant structures appear necessary and are enumerated in the following paragraph.

7.2 RECOMMENDATIONS

It is recommended that a competent consulting engineer be retained by the owner, within 12 months after receipt of this Phase I Inspection Report, to determine the measures necessary for improvement of the discharge capacities.

7.3 REMEDIAL MEASURES

a. Alternatives

The results of the additional investigations recommended above may indicate alternatives which will be needed to provide discharge adequacy under flood conditions. These alternatives can only be determined after the completion and evaluation of the additional investigations.

b. Operating & Maintenance Procedures

It is recommended that the following measures be undertaken by the owner within the next 24 months after receipt of this Phase I Inspection Report.

1. Establish a formal program of operation and maintenance, and initiate biennial inspections of the dam.
2. Provide round-the-clock surveillance during periods of unusually heavy precipitation.
3. Develop a formal system for warning downstream residents in case of emergency.
4. All vegetation on both slopes should be kept in a close cut condition.
5. All brush, shrubs, and young saplings should be removed from the embankment and the area immediately downstream of the embankment toe. Large conifers, but not deciduous hardwoods, should be removed and the remaining trees should be inventoried and their condition monitored. If a tree dies, the area

around the tree should be closely monitored for seepage.

6. All training walls should be repaired and/or rebuilt.
7. After the repair of training walls the area of settlement and erosion should be improved.
8. Debris and overhanging trees should be removed and hauled away from all downstream channels.
9. The erosion and undercutting of the approach slopes should be repaired and slope protection should be provided to prevent the reoccurrence of this condition.
10. The gully adjacent to the upstream training wall should be filled with suitable material.
11. Where no turf exists, the areas should be seeded.

VISUAL INSPECTION CHECKLIST

APPENDIX A

VISUAL INSPECTION CHECK LIST  
PARTY ORGANIZATION

PROJECT SILVER LAKE DAM

DATE 9-28-78

TIME 9:30 AM

WEATHER Cloudy 50°-65°F

W.S. ELEV. 125.17 \* U.S.

PARTY:

- |                              |           |
|------------------------------|-----------|
| 1. <u>Harvey S. Feldman</u>  | 6. _____  |
| 2. <u>Jyotindra H. Patel</u> | 7. _____  |
| 3. _____                     | 8. _____  |
| 4. _____                     | 9. _____  |
| 5. _____                     | 10. _____ |

PROJECT FEATURE	INSPECTED BY	REMARKS
1. <u>All project features inspected by party members</u>		
2. _____		
3. _____		
4. _____		
5. _____		
6. _____		
7. _____		
8. _____		
9. _____		
10. _____		

\* Since no information was available regarding elevation of the spillway notchwater, an elevation of El 125.0 from USGS quad angle sheet and all other elevation measurements taken relative to top of dam. At time of inspection, lake level was 2 inches above spillway notchwater crest.

# PERIODIC INSPECTION CHECK LIST

PROJECT SILVER LAKE DAM DATE 7-22-72  
 PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_  
 DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

## DAM EMBANKMENT

Crest Elevation 128.1 FT

Current Pool Elevation 25.7 FT

Maximum Impoundment to Date Unknown

Surface Cracks None

Pavement Condition No pavement

Movement or Settlement of Crest None

Lateral Movement None

Vertical Alignment Good

Horizontal Alignment Good

Condition at Abutment and at Concrete Structures Generally good on all the South abutment slope adjacent to the spillway there are some signs of erosion

Indications of Movement of Structural Items on Slopes None visible

Trespassing on Slopes In vicinity of the embankment and crest there is some contact (upstream slope) there is deep erosion gully caused by trespassing

Sloughing or Erosion of Slopes or Abutments None visible

Rock Slope Protection - Riprap Failures None

Unusual Movement or Cracking at or near Toes None observed

Unusual Embankment or Downstream Seepage None observed

Piping or Boils None observed

Foundation Drainage Features None

Toe Drains None

Instrumentation System None

Miscellaneous: The downstream slope is irregular and completely covered with heavy vegetation, shrubs, small saplings and large trees. The upstream slope is covered with grass, shrubs, trees and in some areas the turf is missing.

# PERIODIC INSPECTION CHECK LIST

PROJECT SILVER LAKE DAM DATE 7-28-78  
 PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_  
 DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

## OUTLET WORKS - TRANSITION AND CONDUIT

2 feet wide by 3 feet high  
 sluiceway located at the bottom  
 center of the spillway weir.

General Condition of Concrete Not observed because of water flowing.  
 Rust or Staining of Concrete See comment above  
 Spalling See comment above  
 Erosion or Cavitation See comment above  
 Cracking See comment above  
 Alignment of Monoliths N/A  
 Alignment of Joints N/A  
 Numbering of Monoliths N/A

Miscellaneous. It is reported that operating mechanism for the low level gate valve is in working condition. At the time of inspection, the valve stem for the low level gate valve was below the water level. It is reported that the operating handle and stem extension are damaged to prevent vandalism.

# PERIODIC INSPECTION CHECK LIST

PROJECT SILVER LAKE DAM DATE 9-28-78  
 PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_  
 DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

## OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS

### a. Approach Channel

General Condition Fair condition; the approach channel slopes  
 are undercut and eroded; the southern approach channel slopes  
 to extensive undercut and eroded.  
 Loose Rock Overhanging Channel None

Trees Overhanging Channel Few trees overhanging on north  
 side slope of the training wall

Floor of Approach Channel Not observed because  
 spillway was flowing.

### b. Weir and Training Walls

General Condition of concrete Weir in good condition, masonry  
 portion of training wall is in very poor condition. See comments below

Rust or Staining minor rust and staining at  
 weir

Spalling minor spalling at weir and training  
 wall, concrete section

Any Visible Reinforcing None

Any Seepage or Efflorescence Minor seepage, 3 feet from  
 top of wall, at the contact between the wall and fill

Drain Holes None

### c. Discharge Channel

General Condition in good condition

Loose Rock Overhanging Channel None

Trees Overhanging Channel some overhanging trees  
 in natural channel

Floor of Channel concrete and natural bed.

Other Obstructions Remnants of the old spillway remain and extend about 2 feet from each side into the spillway channel; some debris in the channel.

Miscellaneous The north training wall - upper 2 to 3 feet is tilting towards the chute resulting in about 6 inches of surface settlement of the adjacent embankment.

DRAWINGS AND INSPECTION REPORTS

APPENDIX B

# INSPECTION REPORT - DAMS AND RESERVOIRS

## 1. LOCATION:

City/Town Agawam County Hampden Dam No. 2757

Name of Dam Silver Lake Dam

Mass. Rect.

Topo Sheet No. 12C Coordinates: N 390,850, E 292,120

Inspected by: Harold T. Shumway, On July 7, 1976 Date  
Last Inspection 5-1-74

## 2. OWNER/S: As of July 7, 1976

per: Assessors \_\_\_\_\_, Reg. of Deeds \_\_\_\_\_, Prev. Insp. x, Per. Contact x

1. Mr. K. Henshaw Gunnland Ranch, Goldendale, Washington 98620  
Name St. & No. City/Town State Tel. No.

M Mr. Henshaw's Legal Representative

2. Attorney M. Baitler, 10 Central St., West Springfield, Mass 737-1140  
Name St. & No. City/Town State Tel. No.

3. \_\_\_\_\_  
Name St. & No. City/Town State Tel. No.

## 3. CARETAKER: (if any) e.g. superintendent, plant manager, appointed by absentee owner, appointed by multi owners.

Silver Lake Association

c/o Mr. John Lowell, President, 37 Gunn Geary Lane, Agawam Mass.  
Name St. & No. City/Town State Tel. No.

## 4. DATA:

No. of Pictures Taken None Sketches See description of Dam  
Plans, Where See Description of Dam dated October 20, 1972

## 5. DEGREE OF HAZARD: (if dam should fail completely)\*

1. Minor \_\_\_\_\_ 3. Severe \_\_\_\_\_

2. Moderate x 4. Disastrous \_\_\_\_\_

Comments: Approx. 18 million gallons impoundment- Hazard would increase to severe if development expands a short distance downstream.

\*This rating may change as land use changes (future development).

⑥ OUTLETS: OUTLET CONTROLS AND DRAWDOWN

At approx. center of dam- concrete overflow spillway  
No. 1 Location and Type: 94' W. x 2'8" H. with a 4' W x 8" H. weir notch and a dropwall 6'-2"H.

Controls none, TYPE: \_\_\_\_\_.

Automatic \_\_\_\_\_. Manual \_\_\_\_\_. Operative Yes \_\_\_\_\_, No \_\_\_\_\_.

Comments: concrete spillway and dropwall at up stream end of a concrete and stone masonry chute that is badly deteriorated.

At bottom center of dropwall - 2'X3' sluiceway  
No. 2 Location and Type: emptying into above noted chute.

Controls yes, Type: Screw operated gate valve on pond side.

Automatic \_\_\_\_\_. Manual X. Operative Yes X, No \_\_\_\_\_.

Comments: Operable per Mr. Lowell and Mr. Cleary. Handle in Mr. Lowell's possession.

No. 3 Location and Type: Downstream of spillway dropwall conc. & stone masonry chute 13' long X 9 1/2' Wide- expanding to a stepped dropwall 16' +

Controls none, Type: wide by 20' + long.

Automatic \_\_\_\_\_. Manual \_\_\_\_\_. Operative Yes \_\_\_\_\_, No \_\_\_\_\_.

Comments: southerly side wall completely gone on top 4' of original wall - northerly sidewall badly spalled and cracked- rest of structure has moderate spalling.

Drawdown present yes X, No \_\_\_\_\_. Operative Yes X, No \_\_\_\_\_.

Comments: See item No. 2 above.

⑦ DAM UPSTREAM FACE: Embankment varies 2:1 to 6:1 - masonry spillway  
Slope vertical, Depth Water at Dam 5' +.

Material: Turf X. Brush & Trees X. Rock fill \_\_\_\_\_. Masonry X. Wood \_\_\_\_\_.  
conc.

Other stone and conc. masonry.

Condition: 1. Good \_\_\_\_\_. 3. Major Repairs \_\_\_\_\_.  
2. Minor Repairs X. 4. Urgent Repairs \_\_\_\_\_.  
Comments: Southerly channel bank just upstream of spill way is undercut.

masonry shows some spalling- Erosion gully upstream of northerly abutment wall.

⑧ DAM DOWNSTREAM FACE: Embankments northerly 2:1, southerly 1:1 adjacent to spillway.  
Slope spillway-vertical wall.

Material: Turf X. Brush & Trees X. Rock Fill \_\_\_\_\_. Masonry X. Wood \_\_\_\_\_.  
conc.

Other \_\_\_\_\_.

Condition: 1. Good \_\_\_\_\_. 3. Major Repairs X.  
2. Minor Repairs \_\_\_\_\_. 4. Urgent Repairs \_\_\_\_\_.  
Comments: See item #6- sub 3 comments above- Also minor see page noted through northerly spillway abutment wall and northerly side wall.

9. EMERGENCY SPILLWAY: Available No. Needed Yes.

Height Above Normal Water                      Ft.

Width                      Ft. Height                      Ft. Material                     .

Condition: 1. Good                     . 3. Major Repairs                     .

2. Minor Repairs                     . 4. Urgent Repairs                     .

Comments: Total spillway opening available is 9' wide by 3' high to top of earthen embankment on northerly end of spillway abutment.

10. WATER LEVEL AT TIME OF INSPECTION: 1/3 Ft. Above x. Below                     .

Top Dam                      F.L. Principal Spillway x- 4'W. x 8"H. weirnotch.

Other                     

Normal Freeboard 3' + Ft.

11. SUMMARY OF DEFICIENCIES NOTED:

Growth (Trees and Brush) on Embankment yes - minor brush growth on banks.

Animal Burrows and Washouts none found

Damage to Slopes or Top of Dam yes - old erosion gully noted just upstream of northerly abutment wall - see remarks.

Cracked or Damaged Masonry yes - see item # 6 - sub 3.

Evidence of Seepage yes - seepage noted on northerly abut. and chute side wall.

Evidence of Piping none found

Leaks " "

Erosion yes - see damage to slopes above.

Trash and/or Debris Impeding Flow none found

Clogged or Blocked Spillway " "

Other Masonry chute below spillway dropwall failing.

(12.)

## OVERALL CONDITION:

1. Safe \_\_\_\_\_.
2. Minor repairs needed \_\_\_\_\_.
3. Conditionally safe - major repairs needed x \_\_\_\_\_.
4. Unsafe \_\_\_\_\_.
5. Reservoir impoundment no longer exists (explain)  
Recommend removal from inspection list \_\_\_\_\_.

(13.)

## REMARKS AND RECOMMENDATIONS: (Fully Explain)

This dam inspection was made with Mr. John Lowell and Mr. Joseph Cleary, Silver Lake Association officials, present. They stated that the Silver Lake Assoc. is negotiating with Mr. K. Henshaw, present owner of dam, to purchase said dam. For this reason, and also because the Silver Lake Assoc. are official caretakers of this dam, Mr. John Lowell, President of the Assoc., requested that copies of all correspondence concerning this dam be sent to him - Silver Lake Association, c/o Mr. John Lowell, President, 37 Gunn Geary Lane, Agawam, Mass.. Mr. Lowell also asked if your office would please send him a letter listing in detail repairs considered necessary to put dam structure back into a safe condition. It was suggested to Mr. Lowell at time of this inspection that hiring the services of a Professional Engineer would seem an appropriate first step for the association to take if they wished to get an estimate of repairs and costs needed to improve dam structure.

No repairs or improvements have been made to dam since last inspection of May 1, 1974, and further deterioration of structure has occurred. The southerly side wall of chute is completely gone on the top 4' + of original structure and earthen bank behind this wall is eroding. The northerly side wall is badly spalled and cracked with seepage noted through cracks. Seepage was also noted through a spalled cavity in the downstream face of northerly spillway abutment wall. Settlement of fill behind northerly chute sidewall is continuing slowly. Under cutting of southerly bank just upstream of spillway dropwall is continuing. Reference is made to inspection. Report and sketches of May 1, 1974 for more detail on existing conditions of dam.

The main spillway dropwall and abutments appear to still be basically sound although spalled - see item # 8 comments - and seeping on northerly end. For this reason the district rates this dam as conditionally safe - major repairs needed, but this rating could rapidly change to an unsafe condition if extreme high water runoffs should occur in the drainage area,

DAM NO. 2-7-5-7

creating exceptional pressures on dam structure.

According to information supplied by Mr. Lowell, the present owner of this dam is Mr. Kenneth Henshaw, Gunnland Ranch, Goldendale, Washington, zip code 98620. His legal representative is Atty. Maurice Baitler, 10 Central St., West Springfield, Mass., and the caretakers of dam are the Silver Lake Association, c/o Mr. John Lowell, President, 37 Gunn Geary Lane, Agawam, Mass.

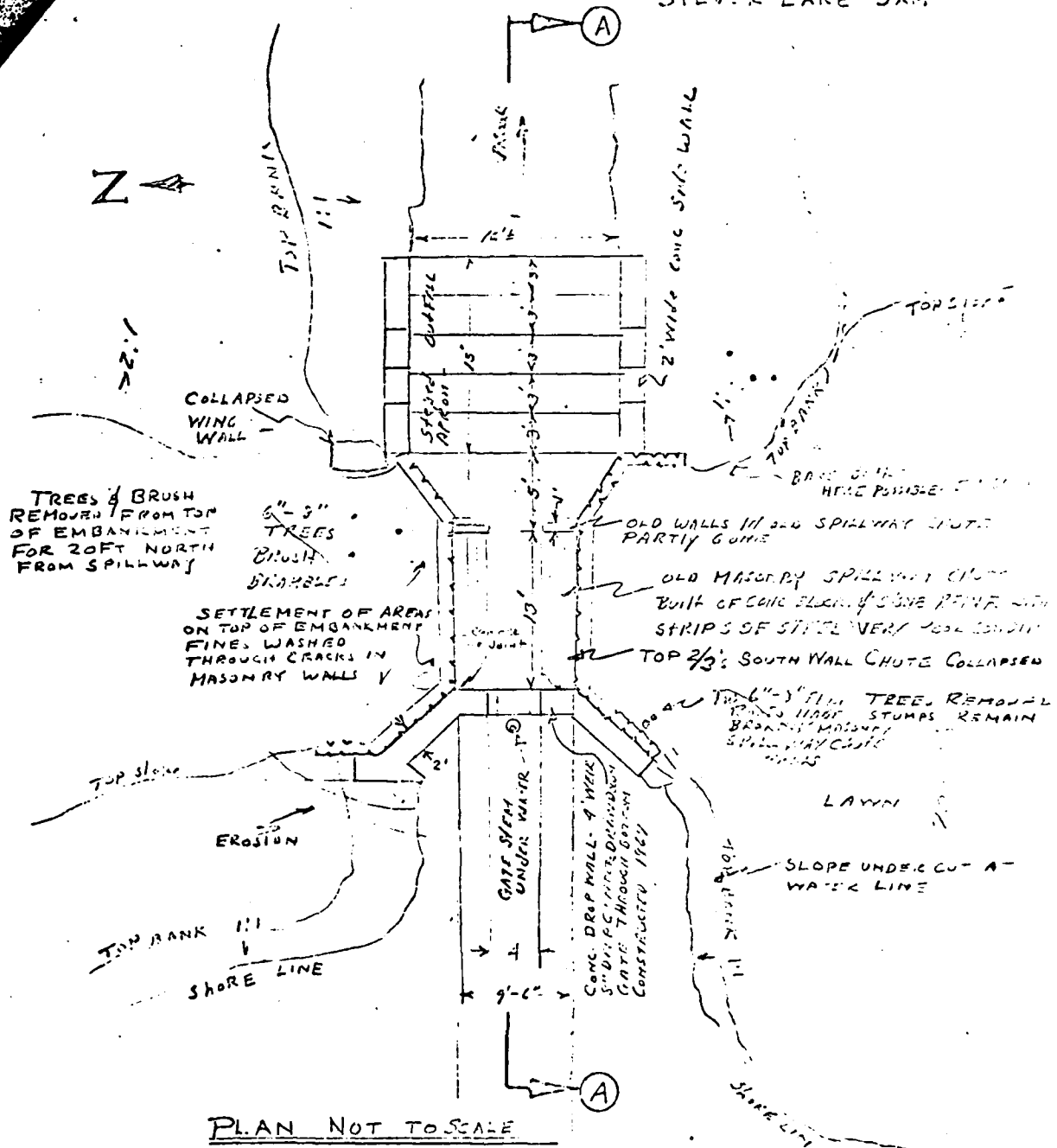
The District recommends that copies of any correspondence concerning this dam be sent to each of the above listed parties.

For a past history of this dam reference is made to inspection reports dated Oct. 20, 1972, and May 1, 1974. Also letters dated Nov. 9, 1972, March 26, 1973, May 30, 1973, May 24, 1974, June 18, 1975, and June 27, 1975.

HTS:lb

SKETCHES

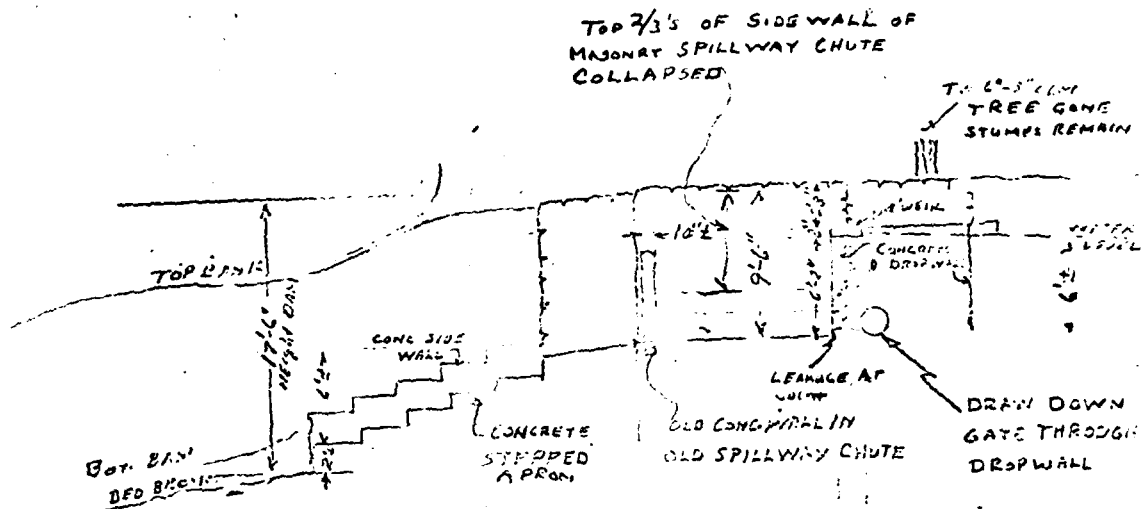
DAM NO. 2-7-5-7  
SILVER LAKE DAM



SILVER  
LAKE

NOTE: RED INDICATES CONDITIONS FOUND DURING INSPECTION OF MAY 1, 1974.

DAM No 2-7-C-7



X SECTION AA

NOT TO SCALE

RED NOTES INDICATE CONDITIONS FOUND DURING INSPECTION OF MAY 1, 1974  
RPS

12.

OVERALL CONDITION:

1. Safe \_\_\_\_\_.
2. Minor repairs needed \_\_\_\_\_.
3. Conditionally safe - major repairs needed \_\_\_\_\_ x \_\_\_\_\_.
4. Unsafe \_\_\_\_\_.
5. Reservoir impoundment no longer exists (explain)  
Recommend removal from inspection list \_\_\_\_\_.

13.

REMARKS AND RECOMMENDATIONS: (Fully Explain)

This dam inspection was made with Mr. John Lowell and Mr. Joseph Cleary, Silver Lake Association officials, present. They stated that the Silver Lake Assoc. is negotiating with Mr. K. Menshaw, present owner of dam, to purchase said dam. For this reason, and also because the Silver Lake Assoc. are official caretakers of this dam, Mr. John Lowell, President of the Assoc., requested that copies of all correspondence concerning this dam be sent to him - Silver Lake Association, c/o Mr. John Lowell, President, 37 Gunn Geary Lane, Agawam, Mass.. Mr. Lowell also asked if your office would please send him a letter listing in detail repairs considered necessary to put dam structure back into a safe condition. It was suggested to Mr. Lowell at time of this inspection that hiring the services of a Professional Engineer would seem an appropriate first step for the association to take if they wished to get an estimate of repairs and costs needed to improve dam structure.

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The main spillway dropwall and abutments appear to still be basically sound although spalled - see item # 8 comments - and seeping on northerly end. For this reason the district rates this dam as conditionally safe - major repairs needed, but this rating could rapidly change to an unsafe condition if extreme high water runoffs should occur in the drainage area,

DAM NO. 2-7-5-7

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HTS:lb

# DESCRIPTION OF DAM

DISTRICT II.

Submitted by R. C. Salls, P. E.

Dam No. 2-7-5-7

Date October 20, 1972

~~Sidney~~/Town Agawam

Name of Dam Silver Lake Dam

1. Location: Topo Sheet No. 12C Mass. Rect. Coordinates N390.850 E 222.150  
Provide 8 1/2" x 11" in clear copy of topo map with location of Dam clearly indicated.  
On 3 mile brook about 150 ft. south of Mill Street about 500 ft. west of Suffield Street, Route 75.
2. Year built: Unknown Year/s of subsequent repairs 1957
3. Purpose of Dam: Water Supply Recreational Recreational  
Irrigation Other Former Mill and Ice Pond
4. Drainage Area: 1.2 sq. mi. acres.  
Includes airport
5. Normal Ponding Area: 10 Acres; Ave. Depth 5 - 6 ft.  
Impoundment: 18 gals; 55 acre ft.  
Million
6. No. and type of dwellings located adjacent to pond or reservoir  
i.e. summer homes etc. 30+ full time residences
7. Dimensions of Dam: Length 100' ± Max. Height 12'  
Freeboard 3' ±  
Slopes: Upstream Face 4:1 Irregular  
Downstream Face Varies 1:1 to 3 to 1  
Width across top Varies - Embankment irregular say 50 ft. average.

DAM NO. 2-7-5-7

8.

Classification of Dam by Material:

Embankment      Spillway Structure  
Earth X      Conc. Masonry X      Stone Masonry \_\_\_\_\_  
Timber \_\_\_\_\_      Rockfill \_\_\_\_\_      Other \_\_\_\_\_

9.

A. Description of present land usage downstream of dam:

20 % rural; 80 % urban

B. Is there a storage area or flood plain downstream of dam which could accommodate the impoundment in the event of a complete dam failure. yes X no \_\_\_\_\_

Swamp occupying Old Mill Pond Bed just north of Elm Street.

10.

Risk to life and property in event of complete failure.

No. of people 13

No. of homes 13+

No. of businesses 2

No. of industries 1      Type Manufacturing

No. of utilities 2      Type Pole Lines

Railroads None

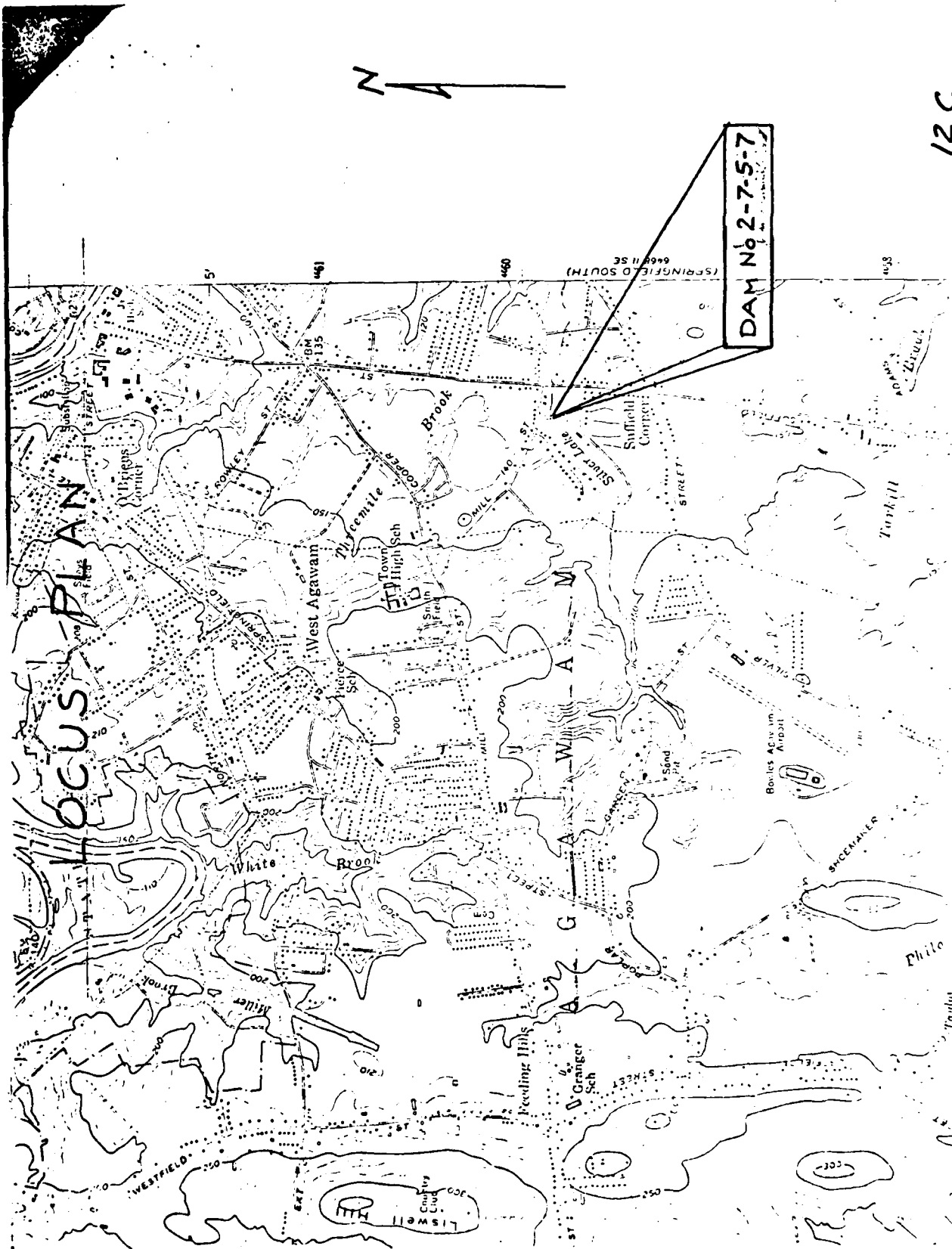
Upstream - DiDonato Dam - 2-7-5-3, Zerra Dam - 2-7-5-4,  
Other dams Provost Dam - 2-7-5-5 and West Springfield Fish and Game Club -  
2-7-5-6.

Other Culvert at Suffield Street at Perry Street, Elm Street, Adams Street  
and Main Street, Route 159.

11.

Attach Sketch of dam to this form showing section and plan on  
8 1/2" x 11" sheet.

RCS/ed



DAM No 2-7-5-7

12C

GEORGE H. McDONNELL  
PHILIP W. SHERIDAN  
EDWARD J. BAYON

Note: These are pertinent excerpts from Original letter.

**TIGHE  
& BOND**

CONSULTING ENGINEERS

CIVIL, SANITARY AND ELECTRICAL ENGINEERING  
INVESTIGATIONS, REPORTS, PLANS AND SPECIFICATIONS  
SUPERVISION OF CONSTRUCTION AND OPERATION

BOWERS AND PEQUOT STREETS  
HOLYOKE, MASSACHUSETTS  
TEL. JEFFERSON 3-3591

CD Agawam  
October 8, 1969

The Honorable the Board of County Commissioners  
52 State Street  
Springfield, Massachusetts

Gentlemen:

Inspections of dams situated within the Town of Agawam have been completed recently and each dam within Agawam has been examined at least once during 1969. The following is a report on the general condition of the various dams situated within the Town of Agawam.



CONSULTING ENGINEERS

G. Silver Lake Dam

The earth embankment sections of this dam are satisfactory. The right section is wide in relation to its height and is well maintained. It has a good sod cover.

The left embankment section is not maintained or trimmed. It is covered with some brush growth but at present the brush growth does not endanger the dam.

**GHE  
BOND**

**CONSULTING ENGINEERS**

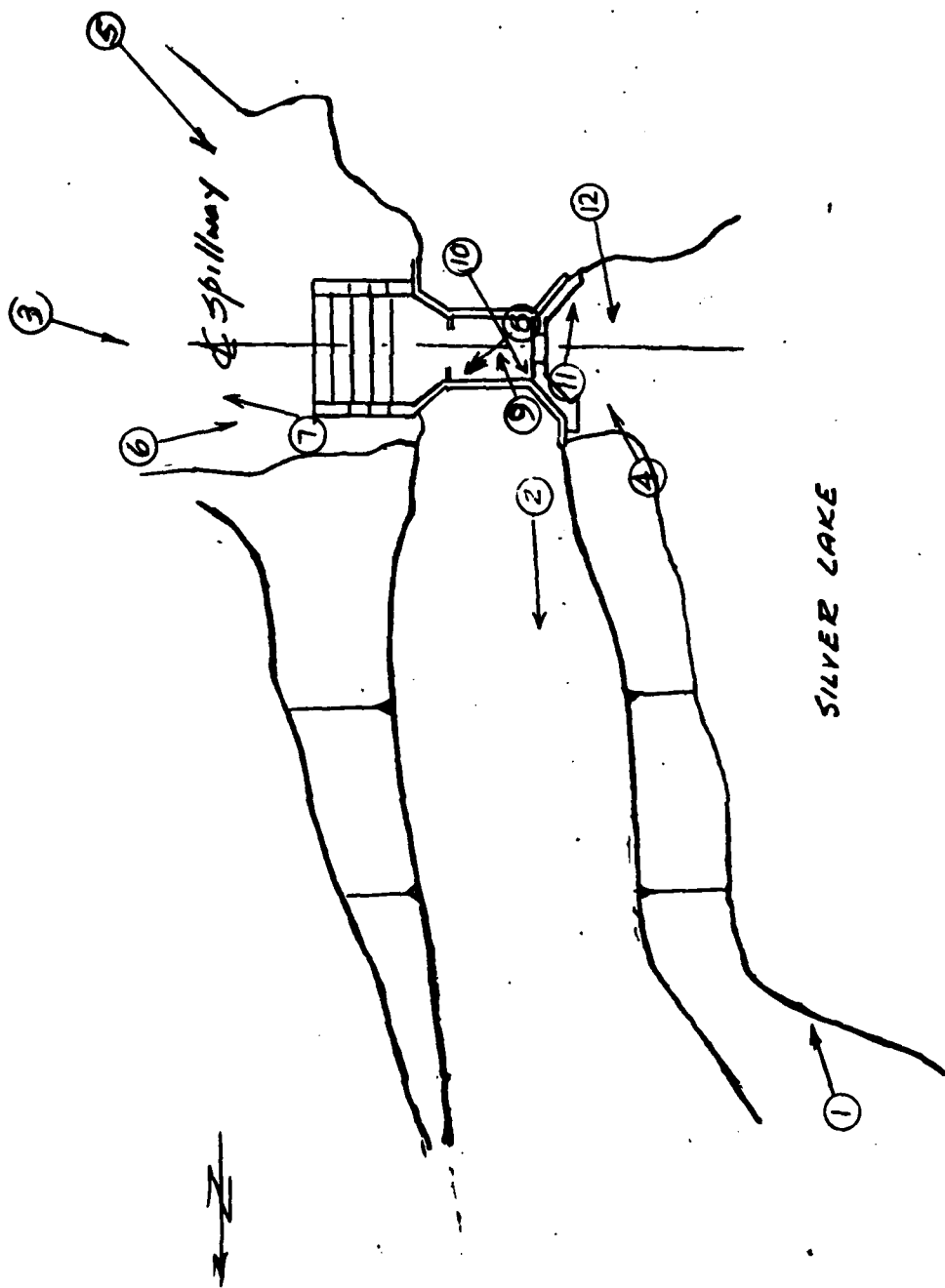
Respectfully submitted,

*George H. McDonnell*  
George H. McDonnell  
County Hydraulic Engineer  
E. E.

GHM/ekd

PHOTOGRAPHS

APPENDIX C



DROOKLINE	TAMS	MASS	US ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS			
SILVER LAKE DAM			
PHOTOGRAPH LOCATION GUIDE			
CONNECTICUT RIVER			
MASS			
Scale: NTS			



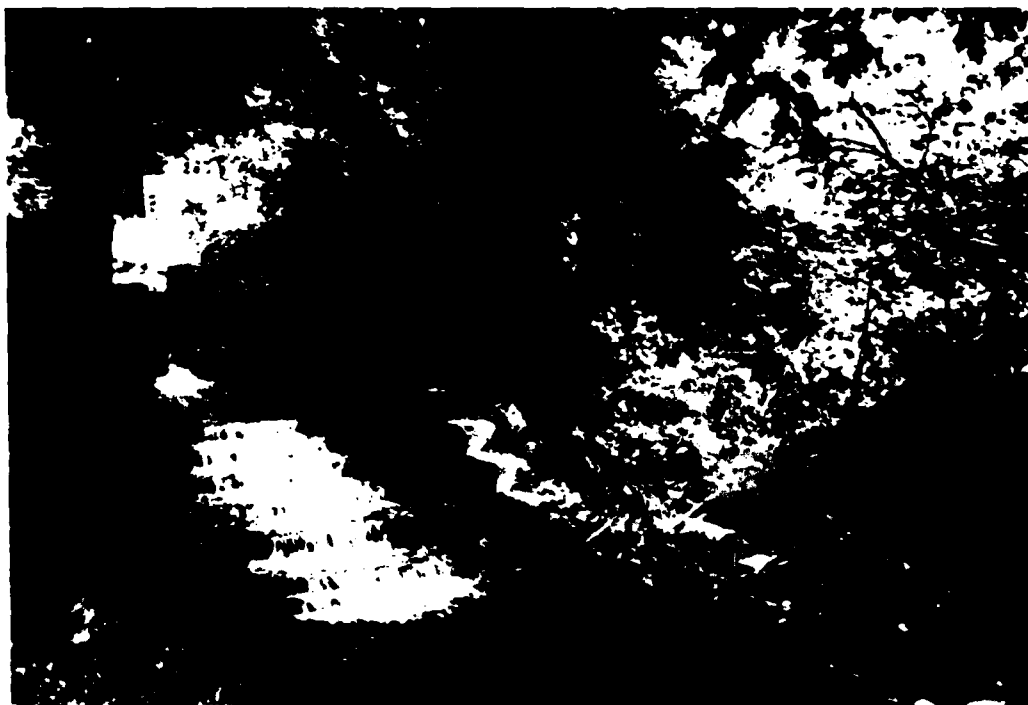
2. VIEW OF CREST LOOKING NORTH. NOTE HEAVY VEGETATION.



3. VIEW OF DOWNSTREAM SLOPE OF DAM IN VICINITY OF THE SPILLWAY CHANNEL. NOTE HEAVY VEGETATION.



4. VIEW OF SPILLWAY APPROACH CHANNEL AND LOW LEVEL WEIR-NOTCH.



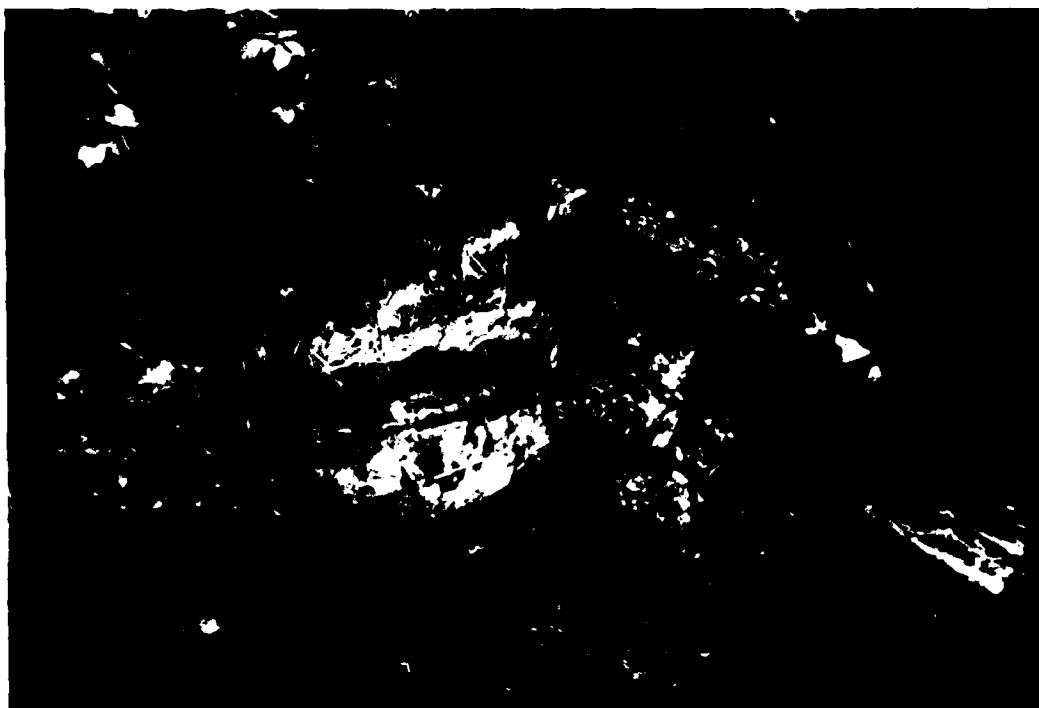
5. VIEW OF STEPPED SPILLWAY CHUTE AND TRAINING WALLS. NOTE STREET DRAINAGE CONDUIT.



6. UPSTREAM VIEW OF SPILLWAY CHUTE AND SPILLWAY. NOTE REMNANT OF OLD SPILLWAY.



7. VIEW OF DOWNSTREAM CHANNEL .



8. VIEW OF DESTROYED SPILLWAY AND POOR CONDITION OF DOWN-STREAM TRAINING WALL, NORTH SIDE.



9. VIEW OF DOWNSTREAM TRAINING WALL, SOUTH SIDE. NOTE COLLAPSE OF UPPER PORTION OF WALL WITH RESULTING EROSION OF SLOPE.



10. VIEW OF SEEPAGE AT CONTACT BETWEEN DOWNSTREAM  
TRAINING WALL, NORTHSIDE AND SPILLWAY WEIR.



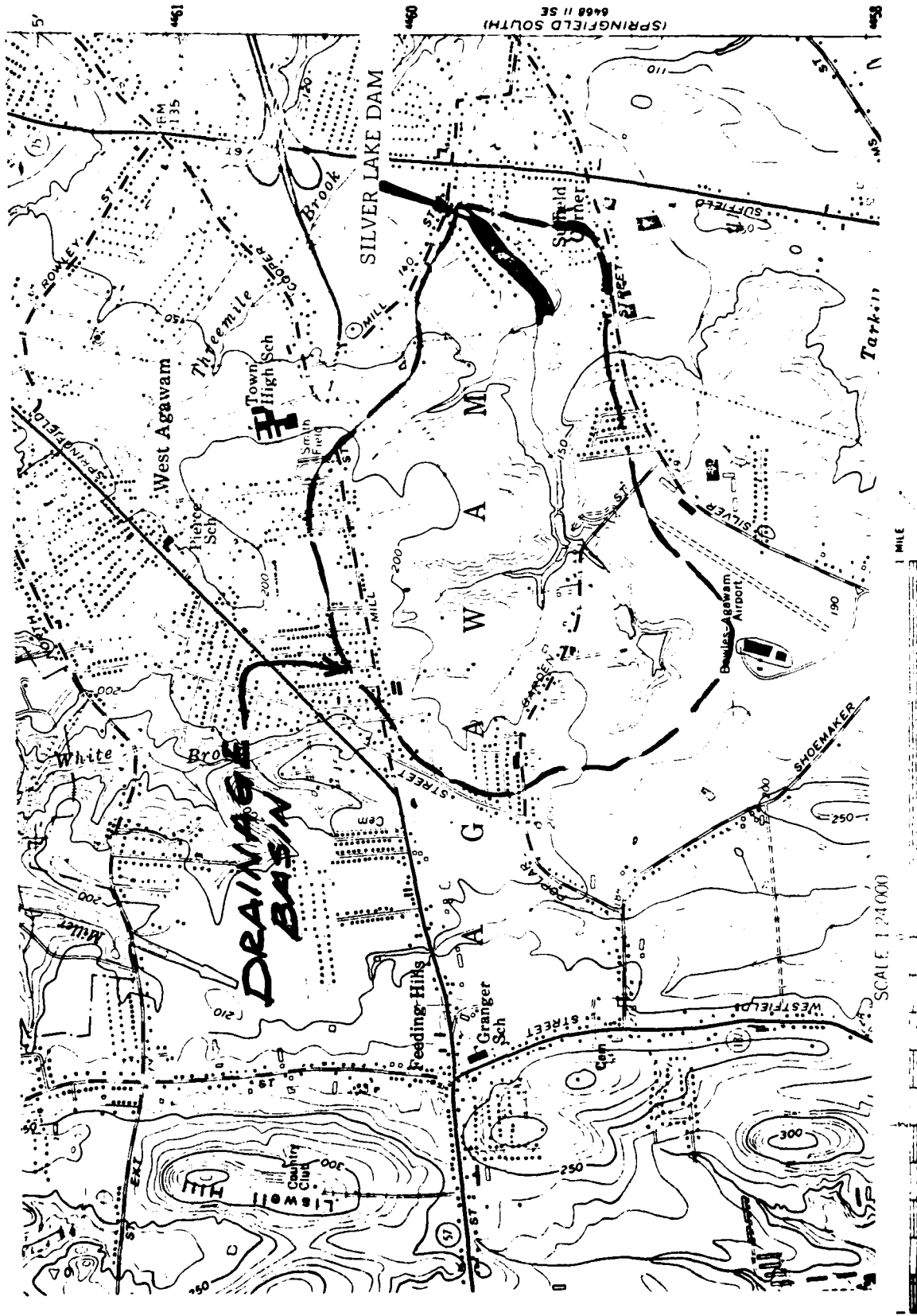
11. VIEW OF SPILLWAY APPROACH CHANNEL, SOUTH SLOPE. NOTE UNDERCUTTING OF SLOPE AND EROSION BEHIND TRAINING WALL.



12. VIEW OF SPILLWAY APPROACH CHANNEL, NORTH SLOPE. NOTE UNDERCUTTING OF SLOPE.

## HYDROLOGIC DATA AND COMPUTATIONS

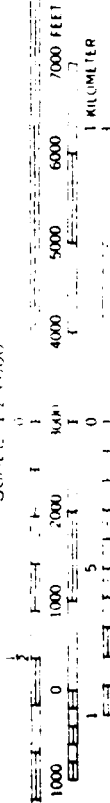
### APPENDIX D



# DRAINAGE BASIN SILVER LAKE DAM

1 MILE

SCALE 1:24,000



CONTOUR INTERVALS 10 AND 20 FEET (SEE DIAGRAM)

# LAKE AREA

Job No. 1497-10 Sheet 1 of 15  
 Project INSPECTION SILVER LAKE Date 6-2-76  
 Subject \_\_\_\_\_ By dlc  
 Ch'k. by \_\_\_\_\_

## LAKE AREA

$$- .0174 \text{ mi}^2 = 11.1 \text{ acres (1.5\% of total)}$$

## Basin Area

$$- 1.13 \text{ mi}^2 = 721.5 \text{ acres}$$

## 25' Contour

$$- 0.0463 \text{ mi}^2 = 29.6 \text{ acres}$$

Normal Lake Level } 125  
 Spillway Crest El }

Bar Height = 125

$\Delta H \sim 5.1$

Longest water course = 8.1 mi = 13.2 km

Length of lake = 1.5 mi = 2.4 km

1:22 PM - 30 - 24 - 21 - 21 - 21 - 21

10 200 - 600 (x 100) = 2400

EC 10-2-27

(x 8) = 8.05

Job No. 1497-10Project INSPECTION SILVER LAKE

Subject \_\_\_\_\_

Sheet 2 of 15Date OCT 2, 78By D.L.C.

Ch'k. by \_\_\_\_\_

$$T_c = \left( \frac{(11.9)L^3}{H} \right)^{0.285} \cdot \left( \frac{((11.9)(1.52)^3)}{80} \right)^{0.285} = 0.78 \text{ hrs} / 46.7 \text{ min}$$

$$L_t = 0.6 T_c =$$

$$D = 11.9 \text{ min} \cdot 0.1.7 \text{ min}$$

$$T_p = L_t + L_r = .0835 + .468 = .5515 \text{ hr} / 33.1 \text{ min}$$

$$A = 1.11 \text{ mi}^2$$

$$Q_p = \frac{484.4 R}{T_p} = 877 \text{ cfs}$$

$$T_b = 2.67 T_p = 1.47 \text{ hr} / 88 \text{ min}$$

Soil Group C

Hydrology

Soil Group EE, UrbanArea 11175% 1

$$S = 0.10 = 79$$

$$S = \frac{1000}{CN} - 10 = 2.66$$

$$L = \frac{(P - 0.53)^2}{P + 2.13} = \frac{(10 - 0.53)^2}{10 + 2.13}$$

4/H Ordinates

T	Q
0	0
10	298.1
20	512.3
30	685.5
40	822.7
50	922.0
60	992.4
70	1032.0
80	1052.0
90	1058.0
100	1060.0

# IAMS

Job No. 1497-10

Project Inspection Silver Lake

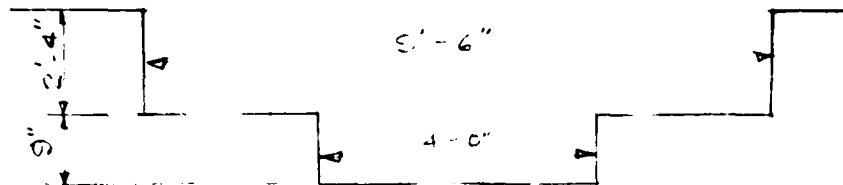
Subject Out-Flow Computations

Sheet 3 of 15

Date Dec 2, 1978

By DLC

Ch'k. by



(NOT TO SCALE)

\* Elevation (Feet)

Elev	Head	C	Q	C	C	Q	Q <sub>2</sub>
125*							
125.4	.4	1	2.64				2.64
125.75	.75	2.20	6.75				6.75
126.0	1.00	2.62	10.24	1.50			12.4
126.5	1.5	2.82	14.8	1.75		9.29	20.1
126.75	2	3.1	16.7			14.6	41.3
127.75	2.75	3.1	57.3			44.3	101
128.08	3	3.22	60.6			57.1	127
129	4		106			92.7	431
131	6	3.32	195	5.05	2.32	107	171
(140)	15	3.32	772	4.05	2.32	562	2,530

Flow over dam (assumed) surface (ft<sup>3</sup>/sec)

126	C	0	
129	1.02	3.05	232
131	2.92	3.05	310
140	11.92	3.05	10,800

# IAMS

Job No. 1497-10

Project INSPECTION SILVER LAKE

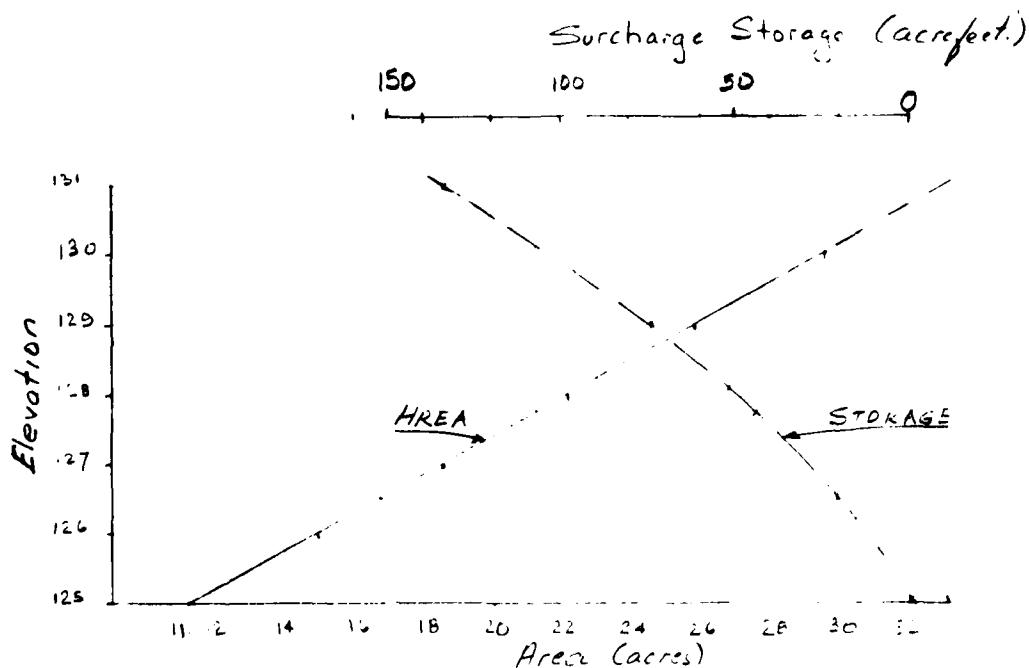
Subject \_\_\_\_\_

Sheet 4 of 15

Date OCT 3 1978

By D.L.C.

Ch'k. by \_\_\_\_\_



El	Area	Mean Area	Δ Vol	Surcharge Storage
125	11.1			0
126.5	16.8	13.55	20.23	20.23
127.75	21.2	19.0	23.75	43.98
128.08	22.1	17.65	7.14	51.12
129.	25.9	24.0	23.05	74.17
131	33.	30.55	35.0	109.17

# IAVIS

Job No. 1497-10

Sheet 5 of 15

Project INSPECTION SILVER LAKE

Date Oct 3, 78

Subject \_\_\_\_\_

By \_\_\_\_\_

Ch'k. by \_\_\_\_\_

Flow thru		2'x3'	Sluice way				$Q = C_d a \sqrt{2gh}$ (See ... p. 232)
El	H	a (sq ft)	H/O	$C_d$	Q		
125	6.0	6	3	0.57	67	spillway crest	
128.1	9.1	6	4.65	0.61	89	Top of Dam	

Sheet No. 6 of 15

TIME (HOURS)	TOTAL RUN-OFF COMPUTED (CFS)	LAKE AREA RUN-OFF (CFS)	RUN-OFF CONTRIBUTIONS BY HYDROGRAPH			
			1 (CFS)	2 (CFS)	3 (CFS)	4 (CFS)
0.000	0.0	0.0	0.0			
0.033	13.3	13.3	0.0			
0.066	13.3	13.3	0.0			
0.100	13.3	13.3	0.0			
0.133	13.3	13.3	0.0			
0.165	13.3	13.3	0.0			
0.200	13.3	13.3	0.0			
0.233	13.3	13.3	0.0			
0.266	13.3	13.3	0.0			
0.300	13.3	13.3	0.0			
0.333	13.3	13.3	0.0			
0.366	13.3	13.3	0.0			
0.399	13.3	13.3	0.0			
0.433	13.3	13.3	0.0			
0.466	13.3	13.3	0.0			
0.499	13.3	13.3	0.0			
0.533	13.3	13.3	0.0			
0.566	13.3	13.3	0.0			
0.599	13.3	13.3	0.0			
0.633	13.3	13.3	0.0			
0.666	13.3	13.3	0.0			
0.699	13.3	13.3	0.0			
0.733	13.3	13.3	0.0			
0.766	13.3	13.3	0.0			
0.799	13.3	13.3	0.0			
0.833	13.3	13.3	0.0			
0.866	13.3	13.3	0.0			
0.899	13.3	13.3	0.0			
0.933	13.3	13.3	0.0			
0.966	13.3	13.3	0.0			
1.000	13.3	13.3	0.0			
1.033	13.3	13.3	0.0			
1.066	13.3	13.3	0.0			
1.099	13.3	13.3	0.0			
1.133	13.3	13.3	0.0			
1.166	13.3	13.3	0.0			
1.199	13.3	13.3	0.0			
1.233	13.3	13.3	0.0			
1.266	13.3	13.3	0.0			
1.299	13.3	13.3	0.0			
1.333	13.3	13.3	0.0			
1.366	13.3	13.3	0.0			
1.399	13.3	13.3	0.0			
1.433	13.3	13.3	0.0			
1.466	13.3	13.3	0.0			
1.499	13.3	13.3	0.0			
1.533	13.3	13.3	0.0			
1.566	13.3	13.3	0.0			
1.599	13.3	13.3	0.0			
1.633	13.3	13.3	0.0			

Sheet No 7 of 15

TIME (HOURS)	TOTAL RUN-OFF COMPUTED (CFS)	LAKE AREA RUN-OFF (CFS)	RUN-OFF CONTRIBUTIONS BY HYDROGRAPH				
			1 (CFS)	2 (CFS)	3 (CFS)	4 (CFS)	5 (CFS)
1.666	697.3	32.0	665.2				
1.699	760.8	37.3	723.5				
1.733	810.9	37.9	772.9				
1.766	849.7	37.9	811.7				
1.799	888.5	37.9	850.5				
1.833	929.1	39.8	889.3				
1.866	1025.6	56.6	969.0				
1.899	1095.3	56.6	1038.7				
1.933	1153.1	56.6	1096.4				
1.966	1210.8	56.6	1154.2				
1.999	1268.6	56.6	1211.9				
2.033	1374.9	56.6	1315.8				
2.066	1404.6	59.0	1405.5				
2.099	1536.9	59.0	1477.8				
2.132	1606.2	59.0	1550.1				
2.166	1681.4	59.0	1622.3				
2.199	1839.8	78.9	1760.9				
2.233	1962.2	81.1	1851.1				
2.266	2059.9	81.1	1978.8				
2.299	2157.5	81.1	2076.5				
2.333	2256.3	82.1	2174.2				
2.366	2441.0	91.1	2349.9				
2.399	2527.4	91.1	2496.3				
2.433	2698.1	91.1	2607.0				
2.466	2808.8	91.1	2717.7				
2.499	2919.5	91.1	2828.4				
2.533	3101.1	84.9	3016.1				
2.566	3256.5	84.9	3171.6				
2.599	3372.6	84.9	3257.6				
2.633	3488.6	84.9	3403.7				
2.666	3604.7	84.9	3519.7				
2.699	3710.7	80.3	3710.4				
2.733	3934.9	70.7	3855.1				
2.766	4023.4	79.7	3943.6				
2.799	4111.8	79.7	4032.0				
2.833	4190.2	78.7	4120.5				
2.866	4345.5	68.9	4276.6				
2.899	4444.0	68.9	4370.1				
2.933	4495.1	68.9	4416.1				
2.966	4522.1	68.9	4431.2				
2.999	4559.2	68.9	4470.2				
3.033	4644.6	58.6	4590.0				
3.066	4697.4	58.6	4636.8				
3.099	4743.9	58.6	4675.3				
3.133	4670.3	58.6	4611.7				
3.166	4656.8	58.6	4594.2				
3.199	4706.5	58.6	4647.9				
3.233	4707.7	52.6	4649.1				
3.266	4644.7	52.5	4591.1				
3.299	4581.6	48.5	4531.1				

Sheet No B of 15

TIME (HOURS)	TOTAL RUN-OFF COMPUTED (CFS)	LAKE AREA RUN-OFF (CFS)	RUN-OFF CONTRIBUTIONS BY HYDROGRAPH				
			1 (CFS)	2 (CFS)	3 (CFS)	4 (CFS)	5 (CFS)
3.333	4523.6	48.5	4475.0				
3.766	4532.4	48.5	4483.8				
3.999	4442.9	48.5	4450.3				
3.433	4413.6	48.5	4365.1				
3.466	4325.4	48.5	4370.8				
3.499	4243.1	48.5	4194.5				
3.533	4205.4	37.6	4171.2				
3.566	4145.3	37.6	4111.6				
3.599	4045.4	37.6	4007.8				
3.633	3941.6	37.6	3904.0				
3.666	3877.4	37.6	3800.1				
3.699	3805.5	37.6	3765.8				
3.733	3755.9	37.6	3692.2				
3.766	3624.4	34.3	3596.0				
3.799	3514.3	30.9	3471.9				
3.833	3404.7	30.9	3373.7				
3.866	3367.7	30.9	3335.7				
3.899	3300.5	30.9	3269.5				
3.933	3194.4	30.9	3165.4				
3.966	3092.3	30.9	3151.3				
3.999	3074.6	30.9	2937.2				
4.033	2943.0	26.0	2817.9				
4.066	2871.1	26.0	2855.1				
4.099	2799.6	26.0	2767.6				
4.133	2692.1	26.0	2672.1				
4.166	2656.5	24.0	2640.6				
4.199	2577.1	26.0	2551.1				
4.233	2520.1	26.0	2500.1				
4.266	2440.1	26.0	2437.0				
4.299	2371.1	26.0	2345.9				
4.333	2294.3	26.0	2268.7				
4.366	2260.2	21.5	2244.7				
4.399	2226.5	21.5	2201.2				
4.433	2195.0	21.5	2134.1				
4.466	2144.5	21.5	2107.0				
4.499	2114.4	21.5	2079.9				
4.533	2082.0	21.5	2046.4				
4.566	2012.7	21.5	1991.6				
4.599	1951.3	21.5	1946.7				
4.633	1880.1	21.5	1891.9				
4.666	1822.5	21.5	1871.0				
4.699	1764.7	19.2	1823.7				
4.733	1706.7	19.2	1771.5				
4.766	1648.2	17.0	1715.8				
4.799	1601.4	17.0	1665.8				
4.833	1552.5	17.0	1612.9				
4.866	1505.7	17.0	1576.6				
4.899	1452.0	17.0	1523.3				
4.933	1392.3	17.0	1461.2				
4.966	1327.9	17.0	1397.9				

Sheet NO. 9 of 15

TIME (HOURS)	TOTAL RUN-OFF COMPUTED (CFS)	LAKE AREA RUN-OFF (CFS)	RUN-OFF CONTRIBUTIONS BY HYDROGRAPH				
			1 (CFS)	2 (CFS)	3 (CFS)	4 (CFS)	5 (CFS)
4.099	1486.6	19.0	1467.6				
5.033	1485.0	18.4	1466.6				
5.066	1470.4	18.4	1452.0				
5.099	1455.4	18.4	1421.0				
5.133	1406.3	18.4	1350.9				
5.166	1377.2	18.4	1358.5				
5.199	1379.3	18.4	1361.4				
5.233	1370.4	18.4	1352.0				
5.266	1346.4	18.4	1327.9				
5.299	1322.3	18.4	1303.9				
5.333	1298.2	18.4	1279.8				
5.366	1305.9	18.4	1277.5				
5.399	1301.7	18.4	1273.3				
5.433	1282.8	18.4	1264.4				
5.466	1263.9	18.4	1245.5				
5.499	1245.0	18.4	1226.6				
5.533	1252.7	16.7	1236.0				
5.566	1250.5	16.7	1233.7				
5.599	1234.1	16.7	1217.3				
5.633	1217.7	16.7	1200.9				
5.666	1201.3	16.7	1184.5				
5.699	1212.6	16.7	1195.9				
5.733	1212.4	16.7	1195.6				
5.766	1198.0	16.7	1181.2				
5.799	1183.6	16.7	1166.8				
5.833	1169.2	16.7	1152.4				
5.866	1166.1	16.7	1149.3				
5.899	1151.4	16.7	1134.6				
5.933	1122.5	16.7	1105.7				
5.966	1109.6	16.7	1076.8				
5.999	1089.0	0.0	1048.0				
6.033	1030.1	0.0	1000.1				
6.066	1001.8	0.0	1001.8				
6.099	960.5	0.0	960.5				
6.133	919.2	0.0	919.2				
6.166	877.9	0.0	877.9				
6.199	846.7	0.0	846.7				
6.233	814.9	0.0	814.9				
6.266	750.2	0.0	750.2				
6.299	695.5	0.0	695.5				
6.333	640.7	0.0	640.7				
6.366	596.0	0.0	596.0				
6.399	551.2	0.0	551.2				
6.433	506.4	0.0	506.4				
6.466	461.7	0.0	461.7				
6.499	416.9	0.0	416.9				
6.533	361.5	0.0	361.5				
6.566	346.7	0.0	346.7				
6.599	311.4	0.0	311.4				
6.633	276.0	0.0	276.0				

Sheet No 10 of 15

TIME (HOURS)	TOTAL RUN-OFF COMPUTED (CFS)	LAKE AREA RUN-OFF (CFS)	RUN-OFF CONTRIBUTIONS BY HYDROGRAPH				
			1 (CFS)	2 (CFS)	3 (CFS)	4 (CFS)	5 (CFS)
6.666	241.5	0.0	241.5				
6.699	216.1	0.0	216.1				
6.733	190.7	0.0	190.7				
6.766	165.3	0.0	165.3				
6.799	139.9	0.0	139.9				
6.833	114.5	0.0	114.5				
6.866	98.7	0.0	98.7				
6.899	82.3	0.0	82.3				
6.933	66.9	0.0	66.9				
6.966	51.1	0.0	51.1				
6.999	35.2	0.0	35.2				
7.033	28.1	0.0	28.1				
7.066	21.1	0.0	21.1				
7.099	14.0	0.0	14.0				

Sheet No. 11 of 15

SAFETY INSPECTION SILVER LAKE MASS.  
JOE NO. 1467-1P  
RESERVOIR ROUTING PROGRAM  
HALF PMF

INPUT PARAMETERS

STARTING ELEV (FT.)	TIME INTERVAL (HOURS)	STARTING TIME (HOURS)	ENDING TIME (HOURS)	PRINT INTERVAL (HOURS)	GATE OPTION	PLOT OPTION	STORAGE COEF.	OUTFLOW COEF.	INFLOW COEF.	TIME COEF.	BREAK TIME
125.00	0.04	0.00	7.09	1	NO	YES	1.000	1.000	0.500	1.000	0.000
RESERVOIR											
ELEV. (FT.)	RESERVOIR STORAGE (ACFT)			RESERVOIR OUTFLOW (CFS)							
125.00	0.0000			0.00							
126.50	20.9600			20.10							
127.75	44.7600			102.00							
128.10	51.8500			127.00							
128.30	73.9000			432.00							
131.00	132.8000			1712.00							

Sheet No. 12 of 15

TIME (HRS)	INFLOW (CFS)	OUTFLOW (CFS)	STORAGE (ACFT)	ELEVATION (FT.)
0.00	0.00	0.01	0.0000	125.00
0.04	5.65	0.04	0.0115	125.00
0.08	6.65	0.04	0.0345	125.00
0.13	6.65	0.08	0.0574	125.00
0.17	6.65	0.11	0.0801	125.00
0.21	6.65	0.14	0.1028	125.00
0.25	6.65	0.18	0.1255	125.00
0.29	6.65	0.21	0.1478	125.01
0.34	6.84	0.24	0.1704	125.01
0.38	7.09	0.28	0.1947	125.01
0.42	7.69	0.31	0.2204	125.01
0.47	7.69	0.35	0.2460	125.01
0.50	7.84	0.36	0.2716	125.01
0.55	8.07	0.43	0.2966	125.02
0.59	10.23	0.47	0.3217	125.02
0.63	11.57	0.52	0.3479	125.02
0.67	11.21	0.58	0.4000	125.03
0.71	17.03	0.66	0.4504	125.03
0.76	20.67	0.75	0.5323	125.03
0.80	24.36	0.86	0.5877	125.04
0.84	26.46	0.98	0.6462	125.04
0.88	33.47	1.14	0.7695	125.05
0.92	42.34	1.32	0.9242	125.05
0.97	49.29	1.55	1.0783	125.07
1.01	56.69	1.81	1.2508	125.09
1.05	74.61	2.13	1.4423	125.10
1.09	86.44	2.52	1.7556	125.12
1.17	97.57	2.97	2.0656	125.14
1.21	110.11	3.47	2.4160	125.17
1.25	121.70	4.05	2.8190	125.23
1.29	144.72	4.72	3.2787	125.27
1.33	159.54	5.45	3.7860	125.27
1.36	177.12	6.27	4.3544	125.31
1.39	195.59	7.17	4.9954	125.35
1.42	213.22	8.13	5.6957	125.40
1.47	232.55	9.28	6.4476	125.46
1.51	247.22	10.68	7.2791	125.53
1.55	271.62	11.81	8.2025	125.59
1.60	314.43	13.24	9.2695	125.64
1.64	334.76	14.81	10.2875	125.73
1.68	362.12	16.47	11.4424	125.82
1.72	377.35	18.29	12.7004	125.91
1.77	403.67	20.24	14.0694	126.00
1.81	441.44	22.32	15.4682	126.11
1.85	476.49	24.54	17.0701	126.23
1.90	520.16	26.97	18.7794	126.34
1.94	572.70	29.61	20.5873	126.47
1.97	622.43	34.97	22.5179	126.58
2.02	666.79	41.25	24.5915	126.69

Sheet No. 13 of 15

TIME (HRS)	INFLOW (CFS)	OUTFLOW (CFS)	STORAGE (ACFT)	ELEVATION (FT.)
2.06	731.44	48.03	26.8356	126.51
2.10	769.52	55.20	29.2439	126.57
2.14	814.43	62.59	31.7375	127.07
2.18	833.91	71.19	34.5023	127.21
2.22	868.50	80.11	37.4566	127.36
2.27	1032.91	89.71	40.6332	127.52
2.31	1094.77	99.17	43.6689	127.71
2.35	1111.21	112.13	47.5735	127.88
2.40	1222.62	125.74	51.4429	128.08
2.44	1254.09	177.99	55.4954	128.28
2.48	1224.53	274.65	58.4008	128.41
2.52	1315.81	252.44	63.7882	128.52
2.56	1417.84	352.08	65.1091	128.74
2.50	1624.82	412.11	72.5343	128.94
2.65	1747.17	491.67	76.9417	129.18
2.60	1744.35	504.36	81.3715	129.25
2.71	1943.71	600.15	95.7793	129.40
2.77	2019.74	764.63	96.1264	129.55
2.81	2075.20	876.38	94.3489	129.80
2.84	2150.59	964.23	98.4229	129.83
2.90	2222.46	1034.26	102.5729	129.77
2.94	2342.48	1140.59	106.5065	129.18
2.98	2370.26	1281.00	110.2474	129.32
3.02	2512.48	1294.51	112.5110	130.72
3.07	2569.73	1774.47	117.2664	130.47
3.11	2740.11	1644.90	120.5026	130.58
3.15	2731.71	1598.64	121.4886	130.48
3.19	2743.00	1569.96	124.3464	130.77
3.23	2582.35	1626.67	128.5719	130.56
3.27	2712.52	1777.59	134.2350	130.84
3.32	2874.55	1722.72	137.2937	131.01
3.36	2845.42	1733.49	135.1235	131.07
3.40	2845.71	1791.71	126.7720	131.17
3.44	2812.64	1823.19	129.1751	131.11
3.48	2813.29	1823.75	136.3646	131.22
3.53	2806.67	1872.92	140.2050	131.25
3.57	2641.78	1836.52	143.5980	131.27
3.61	2602.31	1839.21	145.4145	131.29
3.65	2677.49	1624.87	141.6629	131.13
3.70	1997.72	1606.55	141.2749	131.20
3.74	1922.54	1502.90	141.2742	131.20
3.78	1729.57	1591.01	141.2745	131.20
3.82	1712.97	1657.56	140.1790	131.27
3.86	1613.92	1613.11	140.2593	131.26
3.91	1472.54	1559.72	136.5516	131.25
3.95	1524.59	1920.64	136.7802	131.27
3.99	1607.34	1813.71	137.7106	131.24
4.02	1472.64	1764.86	136.4772	131.13
4.07	1490.51	1766.60	135.4736	131.23
4.12	1431.97	1747.56	134.3164	131.24

Sheet No. 14 of 15

TIME (HRS)	INFLOW (CFS)	OUTFLOW (CFS)	STORAGE (ACFT)	ELEVATION (FT.)
4.16	1314.42	1714.01	132.8827	131.00
4.20	1227.83	1654.01	131.5122	130.95
4.24	1252.59	1653.94	130.1287	130.92
4.28	1293.50	1623.00	127.7848	131.85
4.33	1355.16	1590.76	127.2214	130.81
4.37	1431.81	1552.26	125.7859	130.75
4.41	1490.56	1526.14	124.2479	130.70
4.45	1555.54	1493.72	122.7548	130.65
4.49	1615.82	1460.53	121.2215	130.60
4.54	1699.94	1427.67	119.7460	130.55
4.58	1774.02	1395.61	118.2415	130.50
4.62	1850.66	1363.73	116.7265	130.45
4.66	1925.19	1331.66	115.2098	130.40
4.70	1998.52	1300.24	113.6927	130.35
4.75	2070.21	1269.60	112.1750	130.30
4.79	2142.29	1239.92	111.0770	130.25
4.83	2213.01	1209.94	109.6986	130.21
4.87	2285.47	1180.67	108.3597	130.17
4.91	2358.14	1153.04	107.0793	130.12
4.95	2430.01	1125.22	105.8249	130.08
5.00	2495.17	1096.61	104.5895	130.04
5.04	2560.97	1073.01	103.3644	130.00
5.08	2627.72	1048.40	102.2543	129.95
5.12	2694.29	1024.40	101.1597	129.92
5.17	2760.65	1000.72	100.0700	129.88
5.21	2827.69	977.04	99.0267	129.85
5.25	2895.04	956.67	98.0421	129.81
5.29	2963.74	935.94	97.0843	129.78
5.33	3032.55	913.64	96.1510	129.75
5.38	3102.15	890.39	95.2685	129.72
5.42	3172.70	878.42	94.4423	129.69
5.46	3243.70	861.07	93.6470	129.67
5.50	3315.27	844.15	92.8747	129.64
5.54	3387.00	827.19	92.1371	129.61
5.59	3459.29	813.29	91.4455	129.59
5.63	3531.24	799.90	90.7822	129.57
5.67	3603.34	784.96	90.1472	129.55
5.71	3675.29	771.20	89.5319	129.52
5.75	3747.47	759.52	88.9471	129.51
5.80	3819.46	747.71	88.4070	129.49
5.84	3891.37	736.54	87.8157	129.47
5.88	3963.63	724.65	87.2684	129.45
5.92	4035.94	713.50	86.7622	129.44
5.97	4107.70	702.49	86.2970	129.43
6.01	4179.17	690.87	85.7843	129.40
6.05	4250.65	677.61	85.2020	129.38
6.09	4322.40	664.50	84.6500	129.35
6.13	4393.55	650.13	84.1293	129.34
6.17	4464.21	635.14	83.5467	129.32
6.22	4534.92	620.47	82.9724	129.30

Sheet No. 15 of 15

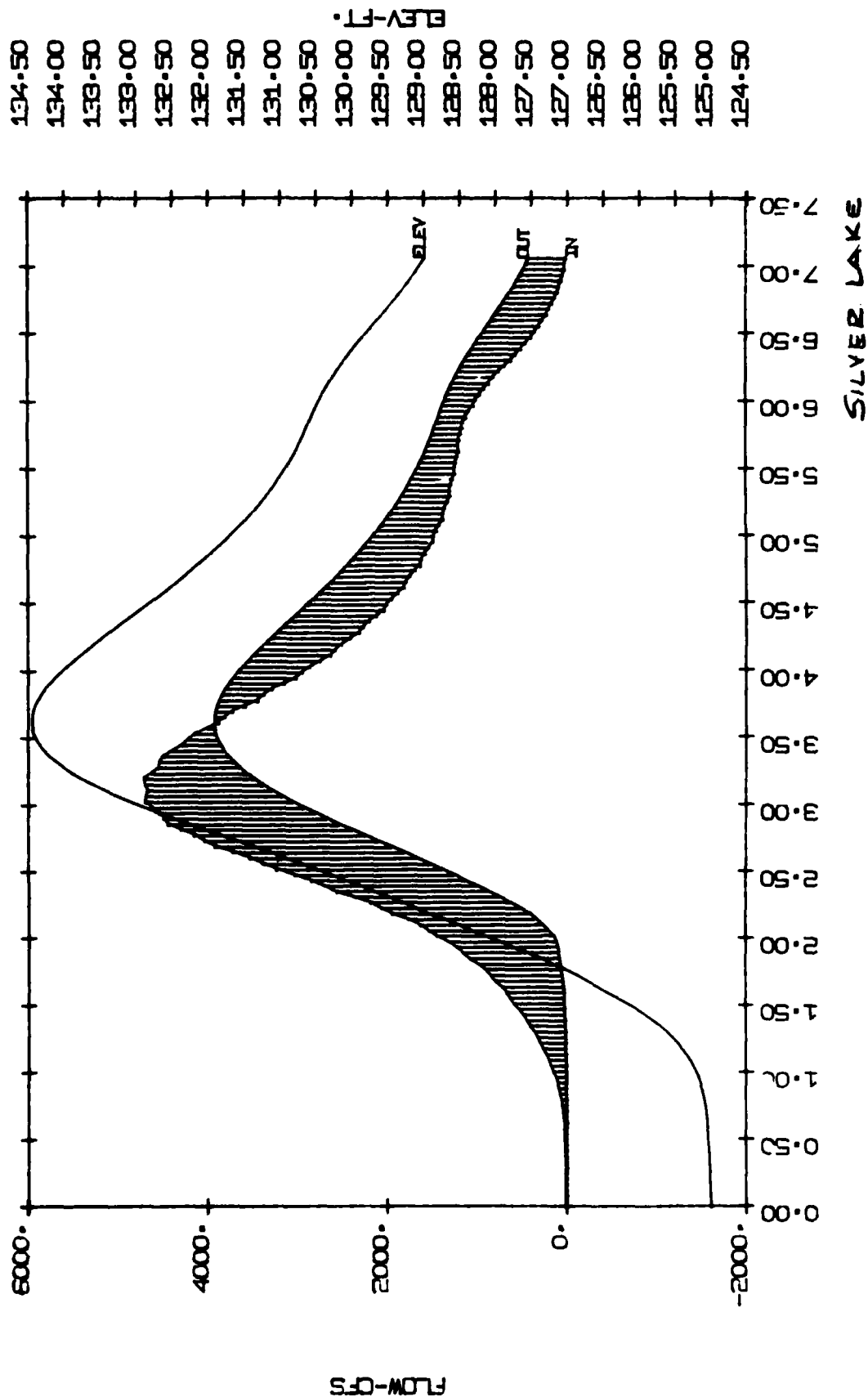
TIME (HRS)	INFLOW (CFS)	OUTFLOW (CFS)	STORAGE (ACFT)	ELEVATION (FT.)
6.26	281.75	604.26	81.9266	125.24
6.30	246.95	566.82	81.0245	125.24
6.34	214.30	535.21	80.1190	125.21
6.38	255.81	548.73	79.2714	125.19
6.42	227.86	528.61	78.3657	125.15
6.47	229.51	507.91	77.3931	125.11
6.51	202.81	456.71	76.4377	125.09
6.55	180.84	465.28	75.4317	125.05
6.59	155.52	443.51	74.4634	125.01
6.64	126.72	425.57	73.4511	125.08
6.68	116.16	411.80	72.4345	125.04
6.72	100.24	397.60	71.4075	125.18
6.76	84.23	383.11	70.3725	125.35
6.80	63.13	368.95	69.3316	125.61
6.84	54.17	354.55	68.2867	125.77
6.88	44.07	340.26	67.2532	125.72
6.92	34.19	326.11	66.2325	125.69
6.97	24.17	292.28	65.2259	125.64
7.01	16.56	278.62	64.2363	125.60
7.06	11.64	255.30	63.2704	125.51
7.10	7.15	232.50	62.3353	125.52

MAX. VALUES  
MIN. VALUES

2252.95  
0.00

171.30  
125.00

SILVER LAKE



APPENDIX E  
INFORMATION AS CONTAINED IN  
THE NATIONAL INVENTORY OF DAMS

# INVENTORY OF DAMS IN THE UNITED STATES

STATE	DIVISION	COUNTY	CITY	NAME	LATITUDE (NORTH)	LONGITUDE (WEST)	REPORT DATE
MA	NED	01		SILVER LAKE DAM	4204.0	7238.4	240CT78

POPULAR NAME	NAME OF IMPOUNDMENT
	SILVER LAKE

REGION	BASIN	RIVER OR STREAM	NEAREST DOWNSTREAM CITY - TOWN - VILLAGE	DIST FROM DAM (MI.)	POPULATION
01	08	TR=THREE MILE HOOK	AGAWAM	0	21700

TYPE OF DAM	YEAR COMPLETED	PURPOSES	SURGE HEIGHT (FT.)	HYDRO. HEIGHT (FT.)	IMPOUNDING CAPACITIES (ACRE-FT.)	MAXIMUM (ACRE-FT.)	NORMAL (ACRE-FT.)
RECTPG	1878	R	12	12	105	54	

DIST OWN FED R PRV/FED SCS A VER/DATE  
N N N N 130ECT8

REMARKS
22 REPORTED 1956 SPILLWAY RECONSTRUCTED

D/S HAS	SPILLWAY	MAXIMUM DISCHARGE (CF)	VOLUME OF DAM (CY)	POWER CAPACITY INSTALLED (KW)	POWER CAPACITY PROPOSED (KW)	NAVIGATION LOCKS
2	85 U 10	127				

OWNER	ENGINEERING BY	CONSTRUCTION BY
MR KENNETH HINSHAW		

DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	NONE	SILVER LK ASSOC

INSPECTION BY	INSPECTION DATE	AUTHORITY FOR INSPECTION
TIPPETS-ABBETT-MCCARTHY-STRATTON	07 JUL 76	PL-92-367

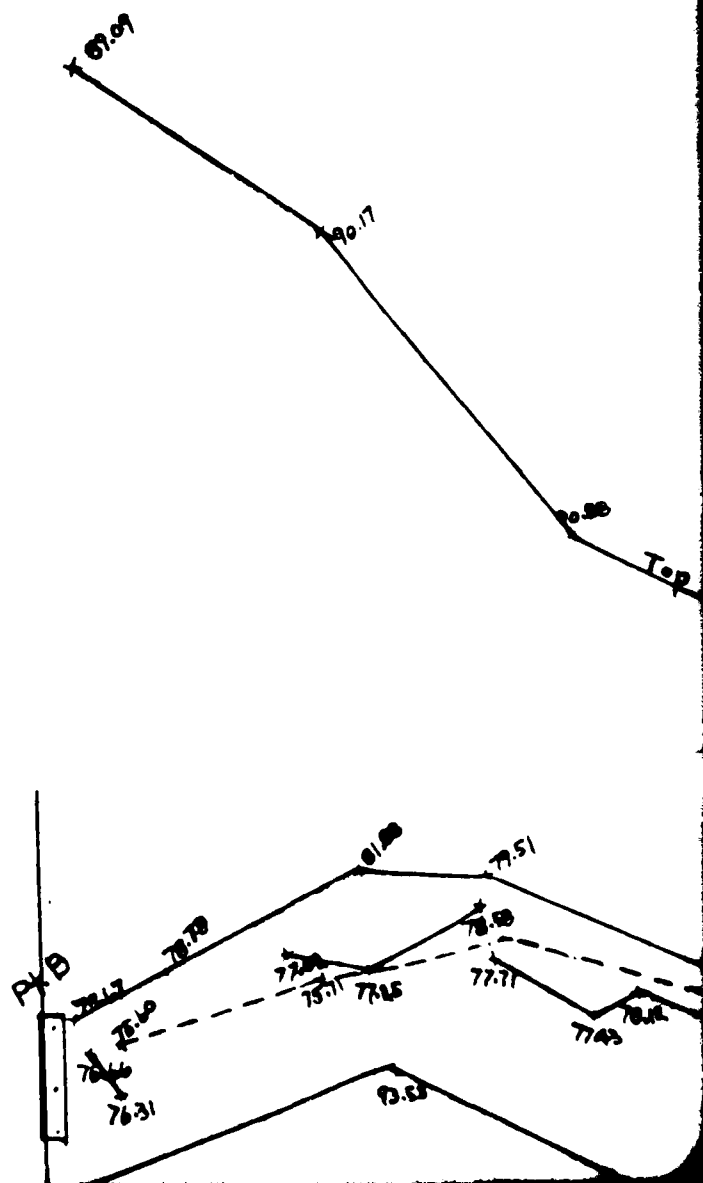
REMARKS
46 BOX 32 GOLDFENDALE WASHINGTON 98620 52 42 EDGE WATER AGAWAM MASS

# PLAN OF MILL ST

AGAW

SCA

FIELD STREET

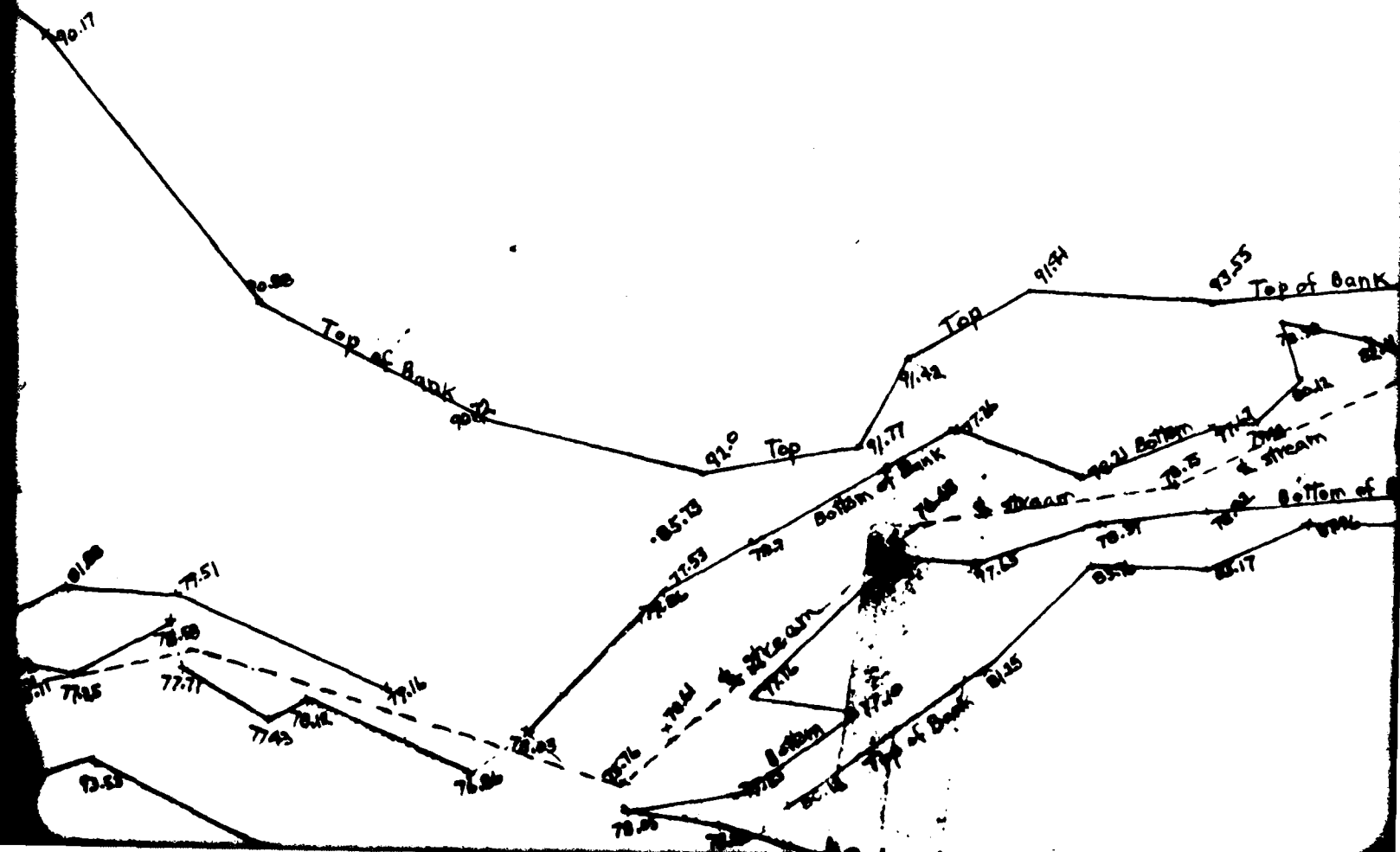


1  
2

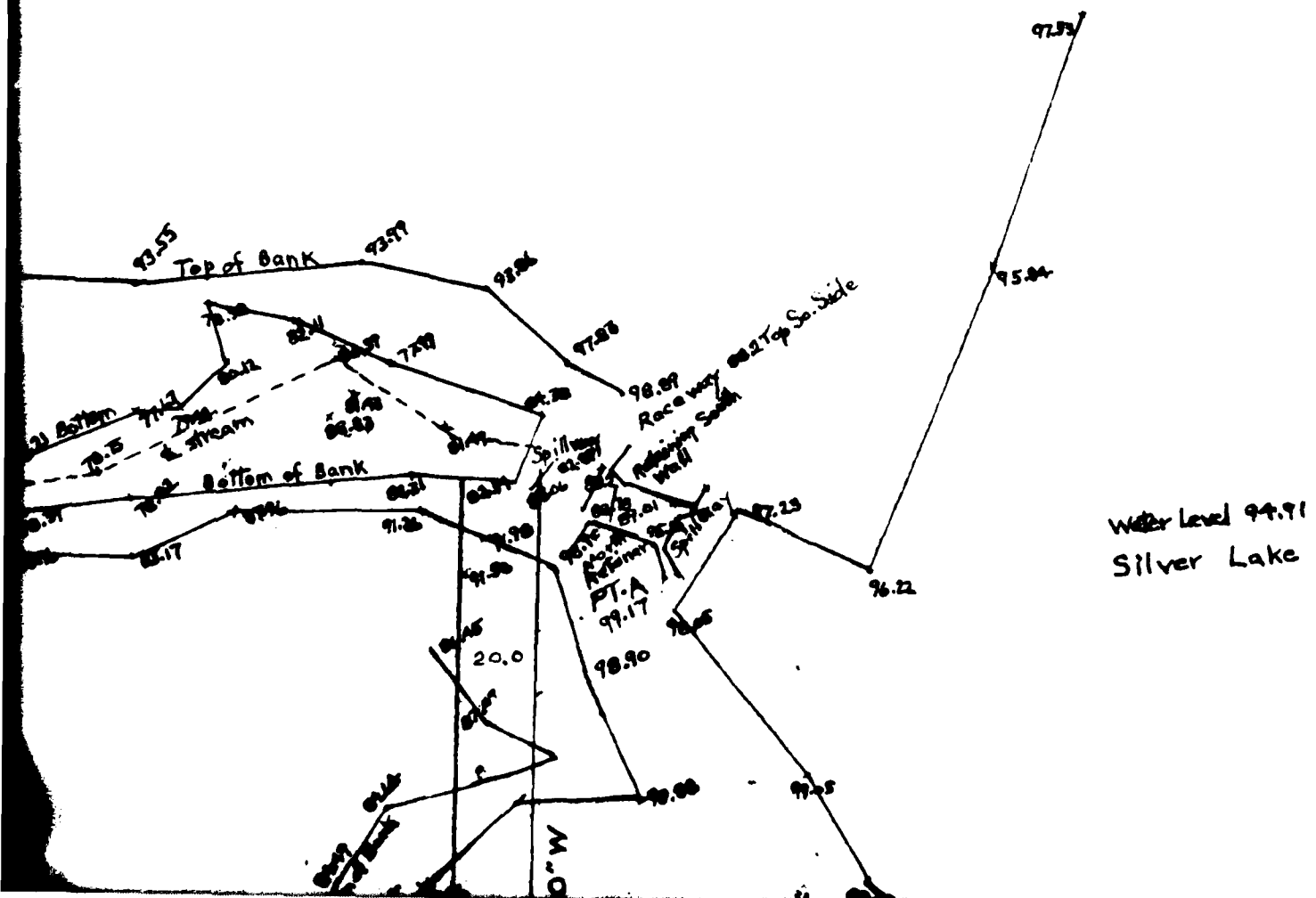
LL STREET SHOWING SILVER

AGAWAM, MASS

SCALE 1" = 40'

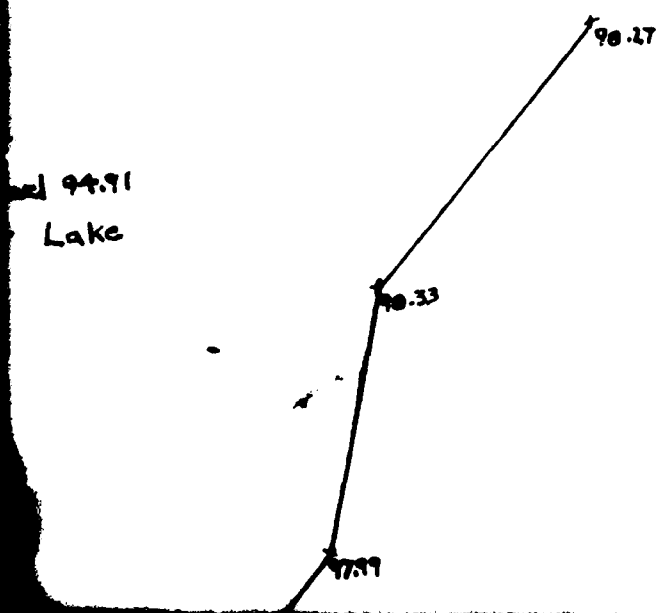


SILVER LAKE AND DRAIN  
PROPERTY OF KENNETT



4  
DRAINAGE EASEMENT ON

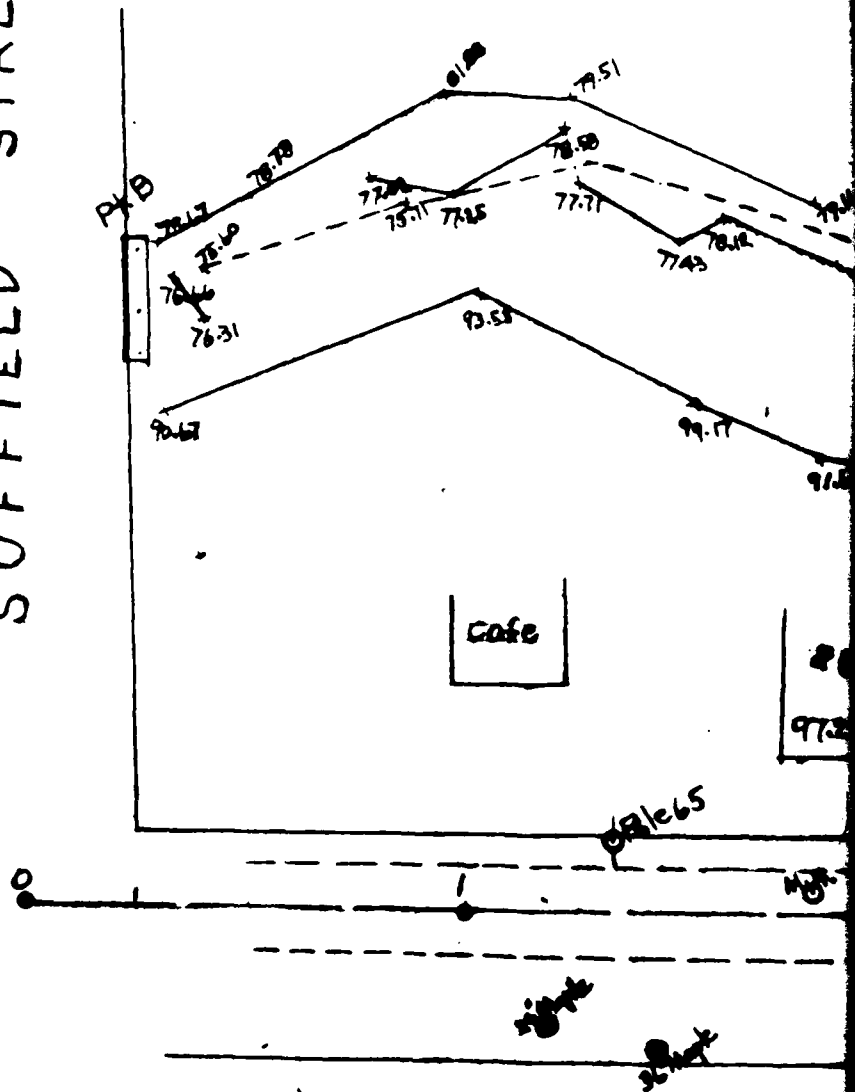
KENNETH G HINSHAW

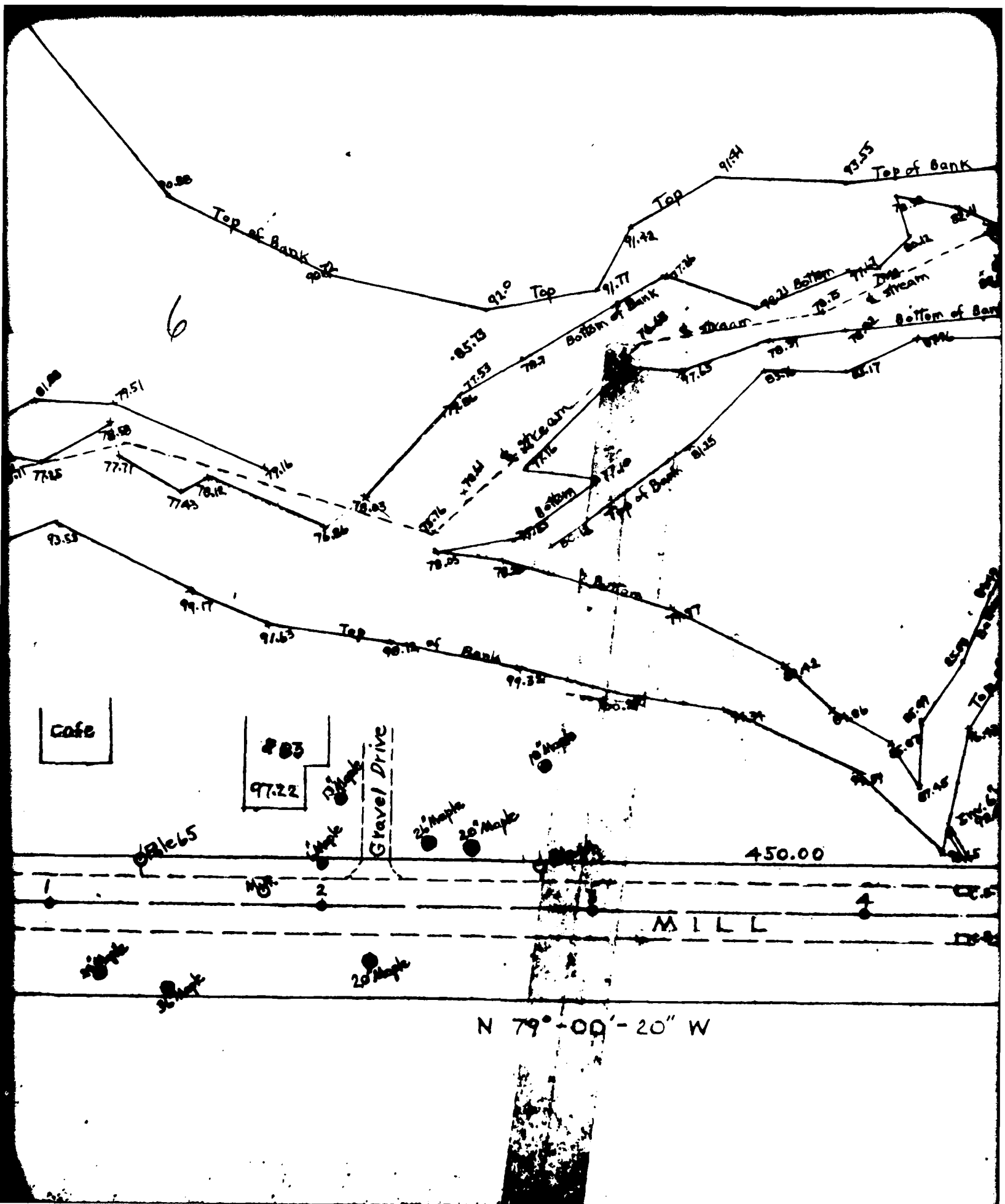


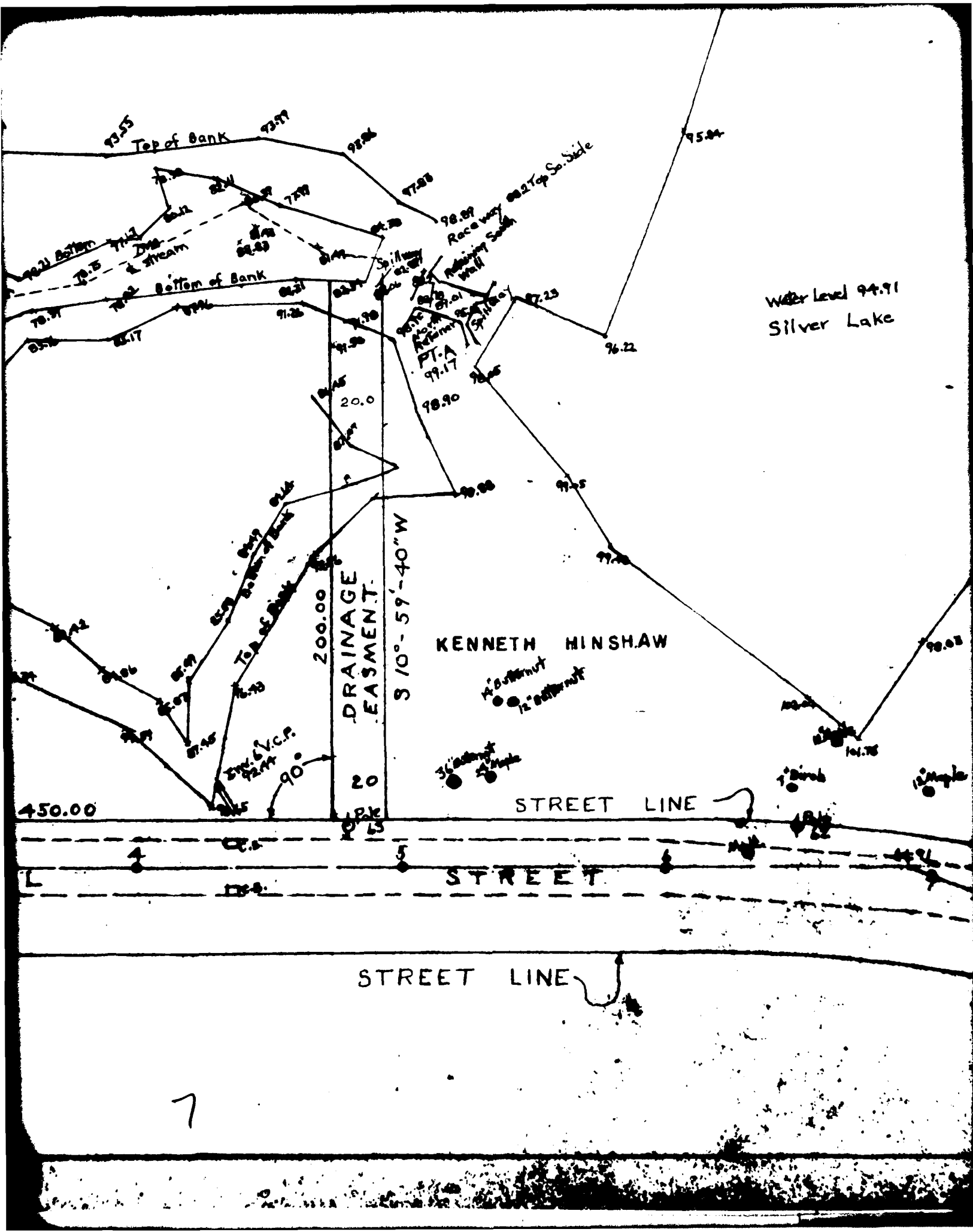
DRIVE

5

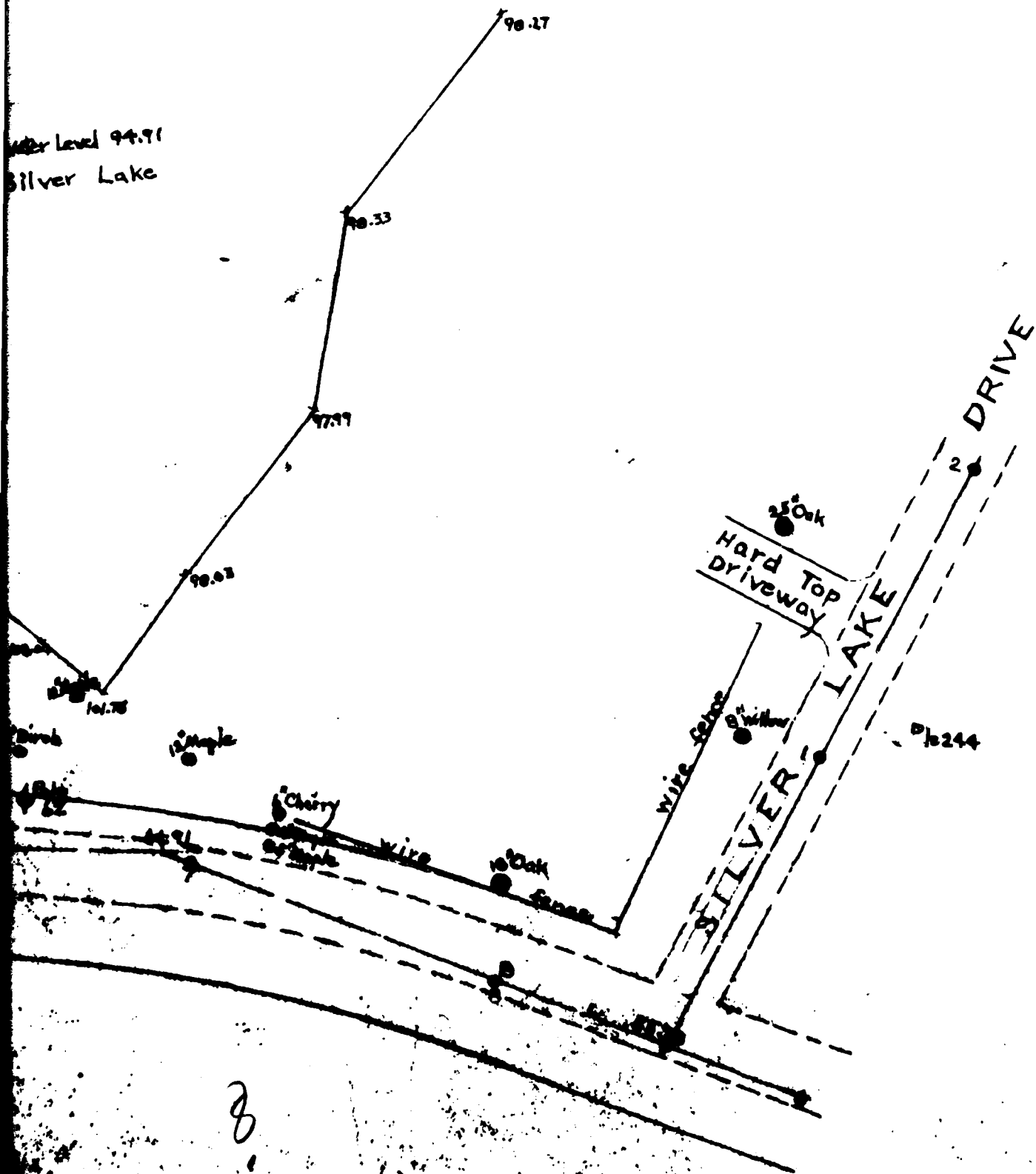
SUFFIELD STREET







Water Level 94.91  
Silver Lake



ATE  
LME